

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## A Modern English Rail Finishing Plant.

In a recent issue *Engineering* illustrates a finishing plant recently designed by Mr. E. Windsor Richards and Mr. Samuel Godfrey, of Middlesborough. It consists of a machine for straightening or bending rails, together with mechanical appliances for handling the rails after they have passed this machine, which *Engineering* describes as follows: Figs. 1 and 2 show the general arrangement of the plant above referred to, and indicate how the rails, after leaving the straightening machine, are carried, by systems of live rollers to the slotting machine, thence to the

wheels. Extending from one main frame to the other are six strong horizontal shafts, carrying rolls F F, disposed in two rows of three in each, two of the shafts in each row being driven by the worm-wheels already mentioned. The two rolls not driven directly by worm gear have adjustable bearings which can be raised or lowered by the screws shown, and that in the upper row is driven by spur gear from one of the worm-driven rolls of the lower row, while on the other hand the adjustable roll of the bottom row is geared to one of the driven rolls of the top row. Toward the right hand of the machine, as shown in Fig. 3, are six vertical rolls, the axes of four of these, F<sub>1</sub>, being fixed

ment of the rolls F<sub>1</sub>, F<sub>1</sub>, is then made by the screws provided for the purpose, so that when the rail leaves the horizontal rolls it will have been straightened in one direction (i. e., as seen in side elevation). From the horizontal rolls it then passes to and between the vertical rolls, wherein a similar straightening operation to that effected between the horizontal rolls will be effected in a direction at right angles to the first (i. e., horizontally); or the rolls may be so adjusted that the rail or other article will be straightened by passing between the horizontal rolls, and bent by passing between the vertical rolls, or vice versa.

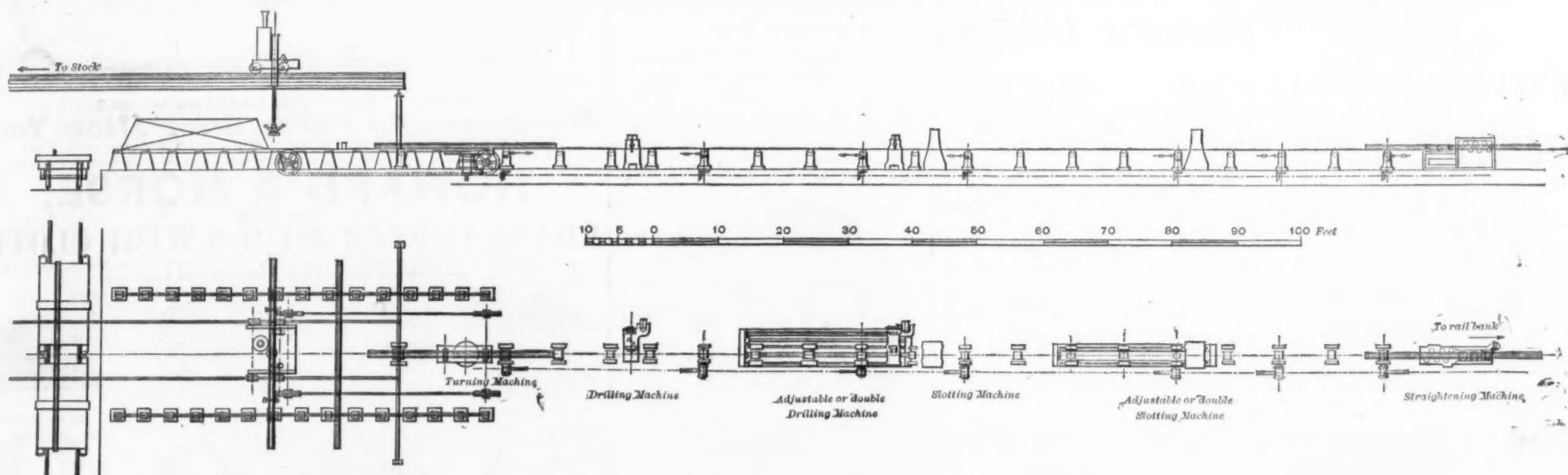
The straightening machine just described

is mounted on a bed, along which it can be shifted, the live rollers (together with the bevel wheels on the line shaft from which these rollers are driven) being also made to slide out of the way of the slotting head.

From the slotting machine the rails are carried on by the live rollers to the drilling machine, which is also furnished with two heads adjustable to different distances apart, so that both ends of the rail may be operated upon simultaneously. Lastly, from the drilling machine the finished rails are passed on by another series of live rollers to the appliances for stacking them and loading them into trucks.

To effect these operations the live rollers

the turntable has made the fourth of a revolution. By the combined lift and turntable just described the finished rails are lifted, turned round at right angles to their proper position and deposited upon a rail bench, along which they are slid by projections from endless chains shown in Figs. 1 and 2. On this rail bench the rails can be readily stacked or loaded into trucks by the arrangement of the overhead steam traveling crane indicated in the views just referred to. The whole arrangement we have described forms a very convenient one for enabling all the finishing operations to be performed upon rails with a very small expenditure of manual labor.



Figs. 1 and 2.—Elevation and Plan of Rail Finishing Plant.

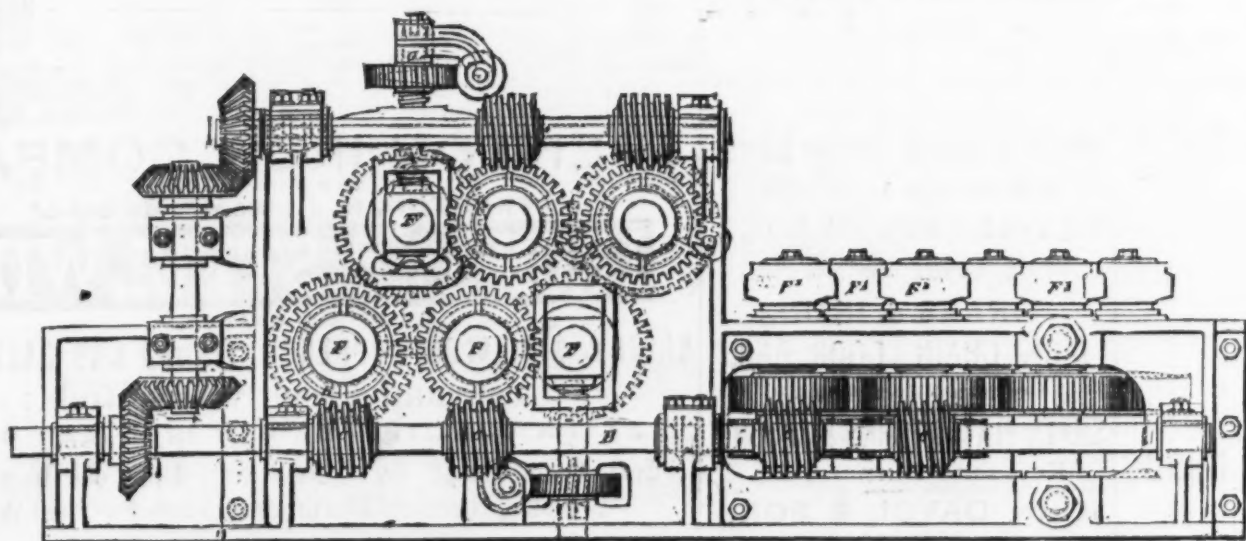


Fig. 3.—Elevation of Rail Straightening Machine.

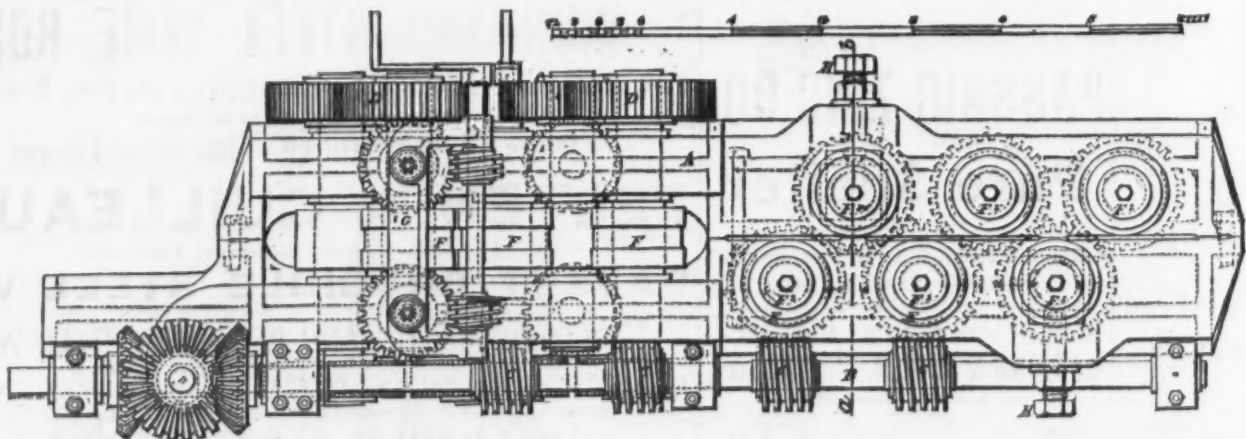


Fig. 4.—Plan of Rail Straightening Machine.

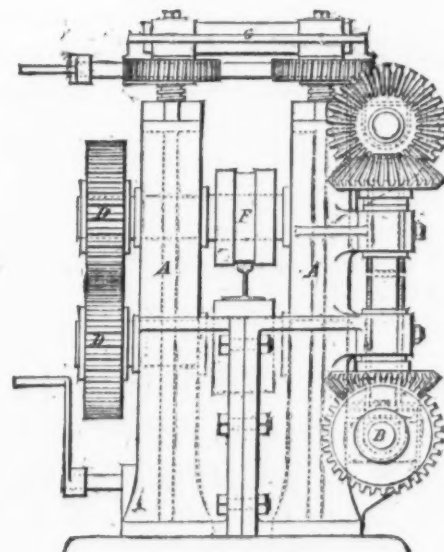


Fig. 5.—End Elevation.

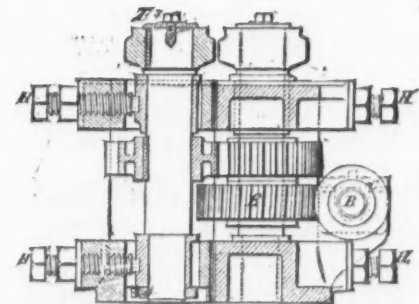


Fig. 6.—Vertical Section.

A MODERN ENGLISH RAIL FINISHING PLANT.

drilling machine, and thence to the appliances by which the rails are stacked or loaded into trucks. The straightening or bending machine is shown drawn to a larger scale in Figs. 3, 4, 5 and 6, and it is with this machine we will first deal.

Referring to Figs. 3 to 6, it will be seen that the machine consists of two main frames, A A, one of which is provided with brackets for carrying the bearings of two driving shafts. The lower driving shaft B, carries on it four worms, the two on the left (see Fig. 3) gearing into vertical wormwheels F F, while the two on the right engage with the horizontal wormwheels E. The upper driving shaft is driven from the lower one through a short intermediate vertical shaft and two pairs of bevel gear, as shown in Fig. 3. The upper driving shaft carries two worms which engage with vertical worm-

in position, while those of the two others, F<sub>1</sub>, are adjustable by means of the screws H H. Two of the vertical rolls are driven by the worm gear already mentioned, while the four others are geared to the driven rolls by spur gearing. The vertical rolls are of a shape suitable to fit the section of the rails passing between them, and they are placed in such a position as to receive a rail after it has passed between the horizontal rolls. At the left-hand or entering end of the machine there are provided guide rollers (not shown in our engraving) for guiding the rails on their way to the horizontal rolls. The mode of performing the straightening operation in this machine is as follows: The rail or other article to be dealt with is first placed between the upper and lower horizontal rolls, to which it is guided by the rollers just mentioned; the adjust-

is intended to receive the rails from the hot bank, and from it the rails are conveyed by a system of live rollers (driven by friction clutch gear) to the slotting machine (see Figs. 1 and 2), where both ends of the rail are acted on simultaneously and the rail reduced to the correct length. The form of machine which it is preferred to employ is that shown in Figs. 7 and 8, page 3, these views representing one of the slotting heads only. In these views A is the main frame of the machine, B the crank-shaft working the ram C, which moves in guide D. E is the rail which is being operated upon, and F is the movable stop for arresting the rail in the proper position, the slotting head shown being that furthest from the straightening machine. To enable the distance apart of the two slotting heads to be adjusted to suit different lengths of rail, one of them

first deliver the finished rails on to a combined lift and turntable, shown in detail in Figs. 9 and 10, page 3, the position of this apparatus relatively to the other machines being shown by Figs. 1 and 2. In Figs. 9 and 10, A is a hydraulic cylinder fitted with a plunger B carrying the turntable C, on to which the rail is delivered by the live rollers. D is the valve controlling the admission of water to and its release from the hydraulic cylinder A, while E E are bevel wheels by which the ram and turntable are rotated, one of the bevel wheels receiving its motion from the shaft G through the friction clutch F. A lever H is provided carrying at its upper end a friction roller which is operated upon by the tappets I these tappets automatically throwing back the lever H, and thereby closing the valve D and throwing the clutch F out of gear after

**Automatic Rolls for Making Steel.**—The Harrisburg Patriot says: The automatic rolls for making steel rails, invented by Mr. Chris. Lewis, formerly superintendent of the Lochiel Works, it was stated yesterday, would be put to practical test in the rail mill at the steel works. If successful it will save the company an immense sum now paid for skilled laborers. Under Mr. Lewis' system the heated steel ingot will pass from the furnace to the rail-straightener entirely by automatic machinery, and by the aid of a single man.

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## An Essay on Springs.

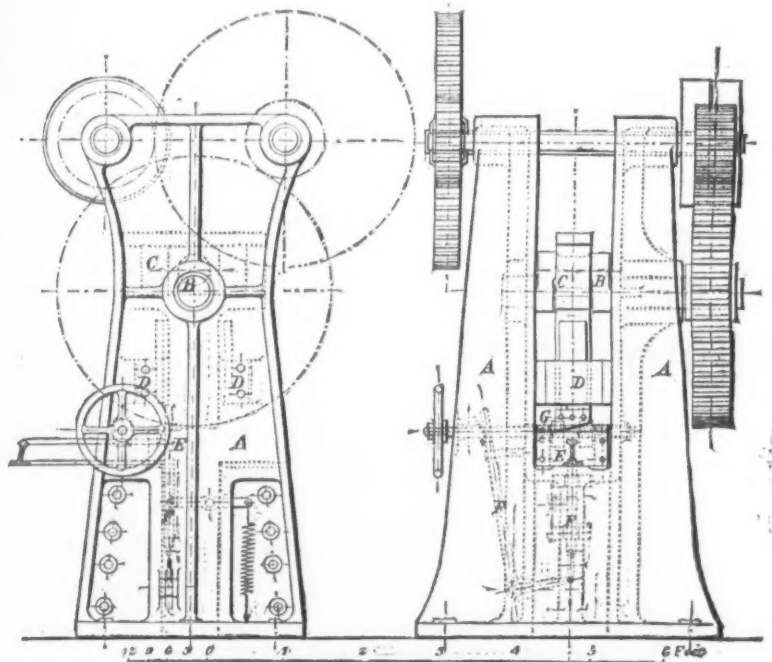
Our enterprising contemporary the *Coach Painter* for May 15 presents the following humorous account of springs, which, although containing some allusions to houses in the trade and patented devices that may not be fully understood by all our readers, we think will be entertaining to those who may peruse it:

There are many kinds of springs known

are adapted to all classes of work, from the lightest carriage to the heaviest wagon. The most notable of these springs are the elliptic, platform, C, side and cross springs.

There are many patent springs, each of which is better than any of its competitors. Chief among the patent springs are the Brewster, Timken, Dexter, Whitney, Henry and the Stivers Circular Spring.

N. B.—There are other circular springs—



Figs. 7 and 8.—Rail Slotting Machine.

to mankind at the present day, and their number daily increases; in fact, very many kinds of springs spring forth in the spring. Springs have been divided by learned scientists into six distinct classes, as follows: 1, Hand springs; 2, Vehicle springs; 3, Car springs; 4, Mountain springs; 5, Mineral springs; 6, the Spring season.

that is, the owners advertise by means of circulars instead of in the trade journals, and of course the spring is never, or hardly ever, heard of outside of the place where it originated.

Elliptic springs are usually made in the form of an ellipse, and were quite popular at one time; in fact, they still retain their

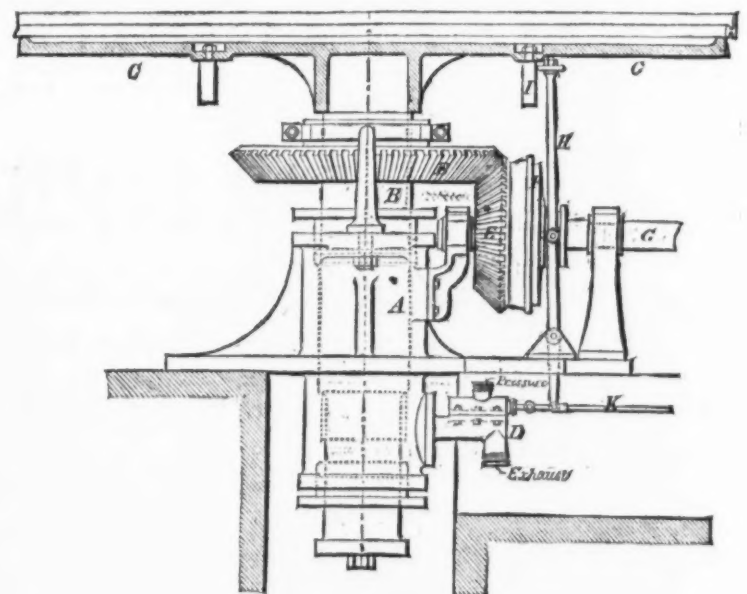


Fig. 9.—Elevation of Rail Lift and Turntable.

Many of these classes are again subdivided, as will be noted further on in this essay. Hand springs were known to the ancients. The Grecian athletes were noted for their proficiency in the art of making hand springs; in fact, the trade journals of that period speak of these springs as being "light, easy and graceful, permitting the body to be suspended very low." Hand springs, however, are not so popular as they

supremacy in those sections where trade journals do not circulate.

Platform springs are used on the heavier classes of vehicles. The platform is essentially constructed to carry heavy loads—notably political platforms.

C springs are so called from having been first used on beach wagons, driven along the seashore. They are especially useful for boys to catch on by, or to hitch their sleds to in winter. For this reason

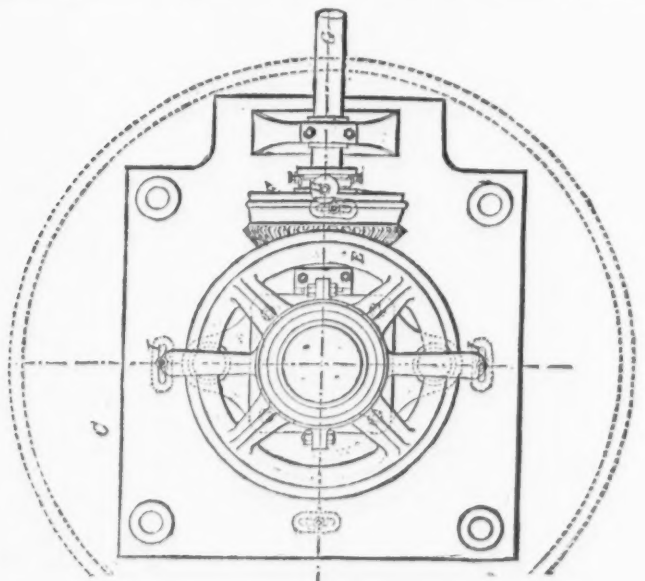


Fig. 10.—Plan of Rail Lift and Turntable.

once were, nearly all springs being now made by machinery.

Vehicle springs have now come into almost general use—especially on vehicles. Vehicle springs are really mineral springs, being made of steel. Some steel springs are, however, made of iron. Exactly when springs were first applied to vehicles is not known, though it is believed the chariots of Pharaoh, King of Egypt, were fitted with a red C-spring.

Vehicle springs are of many kinds and

C-springs are not used on either hearse or sulkeys.

Side springs are just off the road where the thirsty traveler resteth and batheth his feet. They are easy of construction. Any one can make a side spring, especially if a mad dog heaves in sight.

Patent Springs.—Elliptic springs were formerly used exclusively on road wagons, but the owners of fast horses often stopped at inns and refreshment stands, and discovered that their buggies were hung so high that it



Iron.

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was inconvenient to alight. To remedy this obstruction to the quenching of one's thirst, the side-bar buggy was introduced, and has been introducing ever since.

The Brewster spring consists of elliptic springs carefully split in two and attached to the side bar, which is a stick of hickory about the size of a shillalah. To give our readers a clearer idea of these springs, we desire to state that the body rests on the springs and not on the side bars.

The Timken spring is a new spring, and a very gentle and easy-riding spring. When it first made its appearance, some Western poet wrote a beautiful poem, beginning:

"Hail, gentle spring!"

and people, thinking he alluded to the Timken spring, hailed it with fond delight. The Dexter is essentially a mountain spring, running easy over rocks and stones, but finding its way into every valley.

The Whitney is a torsion spring, or was when it started, and the price at which it is sold convinces us that it is not an extortion spring. The great success of this spring is due to storms, the origin of so many lesser springs. The Whitney Spring Co. is limited, but the number of its springs in use is not.

The Henry spring consists of a single leaf, which proves it to be an early spring, before the leaves are thick. The Henry spring is of all shapes, sizes and thicknesses; in fact, a changeable spring.

The Stivers spring is a good one, but has not been as much advertised as some others; hence it is not so well-known. Yet, to speak the truth, there is no end to the Stivers springs used in this country, because they are circular and have no end. (N. B.—There are other springs which are not circular—that end suddenly because they are not advertised.)

Car Springs.—All passenger cars are supposed to have springs. On many of our railroads the passengers imagine the springs are made from heavy blocks of stone, though investigation proves such is not the case. Car springs are not very extensively advertised, though in close contact at all times with car journals.

Mountain springs usually consist of water and are found on every hill side and mountain side. These mountain springs grow into large streams, ultimately forming rivers and lakes. As an example, take Lake Whitney, near New Haven, Conn., which owes its origin to the Whitney Spring. It is probably owing to this fact that springs are frequently painted with lakes. Side springs are good mountain springs, the Dexter being specially valuable in this connection.

Cross springs are not, necessarily, bad springs. In this respect springs differ from human beings, for a spring may be well tempered and yet be cross.

Mineral Springs.—All springs are mineral, being made of steel. Some springs are more mineral than others: Saratoga Springs for instance. We decline saying anything about Saratoga Springs, however, as they are not advertised in this journal.

The spring season is that part of the year immediately preceding summer. (This year is an exception.) 'Tis then the carriage builders begin their labors, and there is a great demand for springs; hence it is called the spring season. There are various kinds of spring, to wit: Early springs—to which class belong the thoroughbrace and elliptic spring; late springs—the side bars; and gentle springs—all patent springs go under this head.

Trade journals are not the only things to puff springs. Occasionally winter gives them a severe puff. Moreover, myriads of poets have wrestled with this theme for countless ages.

"Spring, sprang, beautiful sprung"

has been a keynote to many a masterpiece. But it remained for us to treat spring in a summary manner, which autumn make the spring makers advertise. Perhaps our theories are fallacious, though we are now winter rible earnest.

#### Art and Manufacture.

This compound term is employed to distinguish a certain class of manufactures of a scientific and ingenious nature from others which only require manual skill and dexterity. The line of demarcation between the fine arts and the manufacturing arts is undefined, and in many respects they blend together. From the period of the seventeenth century science and art have been drawn more closely together, and in later years have made rapid progress, each mutually assisting the other.

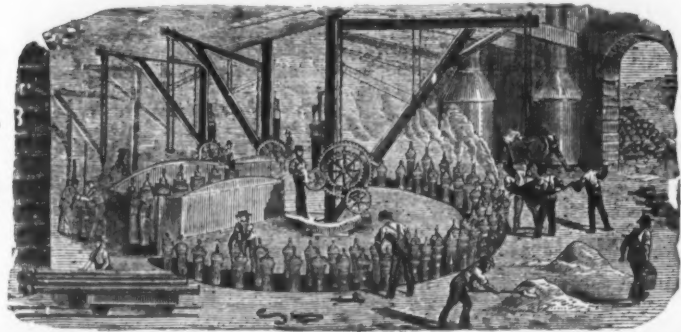
The establishment of schools of art in connection with manufactures is only of recent date in England; but the manner in which all classes have aided and supported the various Schools of Design and Mechanics' Institutions shows that the nation appreciates the value of cultivating manufacturing art. We see the same thing also in the great success which has attended the production of popular works on science in modern times. The discoveries of photography and electro-plating no doubt tended to form closer ties between science and art, while the importance of the establishment of the Museum of South Kensington cannot well be overrated. By means of this institution and others of a like character, the knowledge of science and art is disseminated among the workmen and workwomen of the kingdom.

Another step in the same direction is the appointment of eminent sculptors and painters in order to design models and patterns for manufacturers. Although it is only recently that this country has turned its attention to the furthering of manufacturing art, other nations in Europe have long acknowledged its great importance. The great Exhibition of 1851, by bringing our workmen in contact with foreign workmen and their work, gave a decided impulse to our skilled workmen, and led to much healthy emulation and rivalry. In France, more attention is paid to the artistic education of artisans than in any other country, and we see it reflected in all their handicraft. The Conservatoire des Arts et Metiers, in Paris, is a most remarkable institution. It consists of a number of large halls, each of which is devoted to some particular trade or branch of manufacture, and contains a perfect collection of the raw



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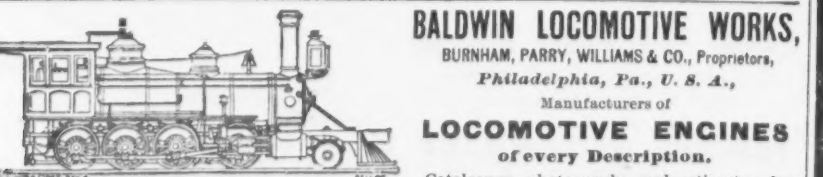
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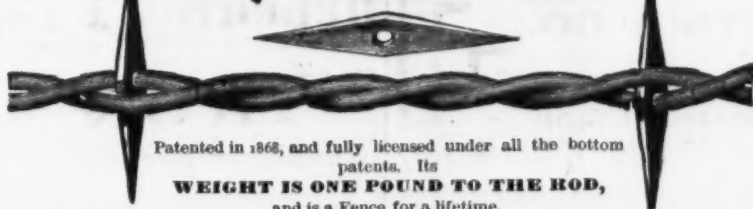
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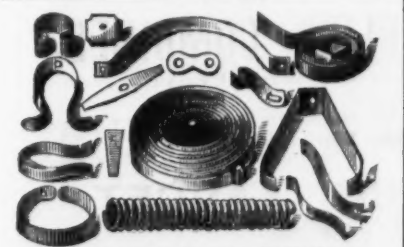
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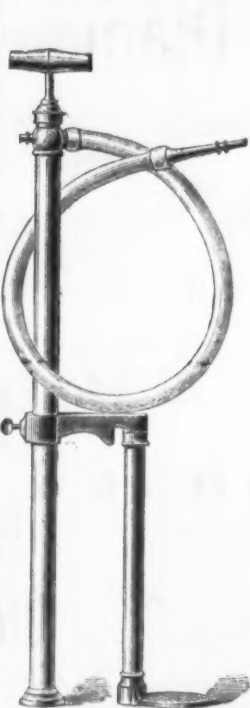
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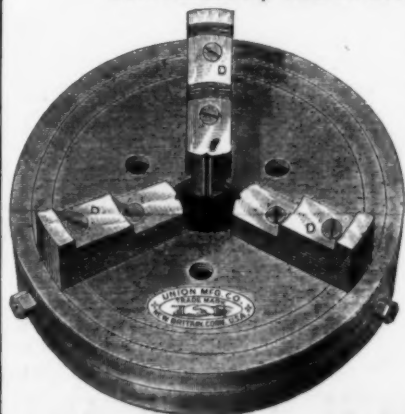
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Magn. Oxide of Iron.....	75.55	Metallic Iron.....	55.43
Protoxide of Iron.....	.83	Metallic Manganese.....	.05
Manganese Oxide.....	.09	Phosphorus.....	.16
Alumina.....	4.43		
Lime.....	1.58		
Magnesia.....	.97		
Silica.....	14.89		
Phosphoric Acid.....	.27		
Sulphur.....	.42		
Titanic acid.....	.07		
Total.....	99.44		

We propose to offer the above F. O. B. at Port Morris, N. Y., guaranteed 50 per cent. Metallic Iron.

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and manufactured produce, together with all the tools and implements employed in the process. Lecturers are appointed to the hall for the instruction of the people. It has been in existence for more than 75 years, and was first suggested by the celebrated philosopher, Rene Descartes, in the seventeenth century. The government is so convinced of the importance of this establishment that it supports it with an annual grant of 150,000 francs (\$30,000).

The selection and arrangement of the objects in these halls are very interesting, since, by exhibiting the implements and machines that have been used from medieval times up to the present day, the gradual improvement can be noted at once. In one department, porcelain and chinaware in all stages of their manufacture can be seen; in another, the process of making clocks and watches. There are models of every variety of steam engine and machine. One hall is devoted to chemistry and electricity, and displays all the apparatus employed, from the crude and clumsy objects of 100 years ago to the delicately finished implements of the manipulator of to-day. Some of the rooms have the ceilings, floors and walls decorated to illustrate ornamental art, and there is an excellent library in connection with the institution. Too much praise cannot be bestowed on such an undertaking as this. The usefulness of bringing together men of the same trade for the interchange of ideas is universally acknowledged, and it is now felt that if the workman receives sound instruction in science and art, it not only adds to his intelligence and comfort, but also secures the advance and prosperity of our manufacturing arts.—*London Pottery Gazette.*

## Papers on Practical Founding.— XXXI.

BY EDWARD KIRK.

### CLEANING THE CASTINGS.

In stove founding heavy and light blacking are always used upon the face of the molds to prevent the molding sand from being burned by the molten iron, so that it will adhere to the surface of the casting. These blackings are only applied to the one side of the molds, and even on that side they do not fully prevent the sand from being burned by the molten iron, so that it will adhere to some parts of the casting. All castings, after they have been turned out of the molds, must be cleaned to remove the adhering sand from the side of the casting where the mold was not blacked, and also to remove any sand that may have adhered to the casting on the side where the mold was blacked. For the purpose of cleaning the castings of all the sand that may have been burned upon either side of them, they are all removed from the molding room to the cleaning or scratch room, in which many of the castings are cleaned. Cleaning benches are also arranged, upon which all castings are cleaned that are not cleaned in the rattle barrels.

In some foundries the principal part of this cleaning is done in the rattle barrels, into which all the castings to be cleaned are loosely packed, with cinder or small scrap iron between them. The rattle barrel is made to revolve slowly, so that the castings will rub slowly against each other and against the cinders and fine scrap. This removes all the sand from the castings, and rubs or grinds off all the pins and roughness from them and gives them a perfectly smooth surface. But the cleaning of the castings in this way grinds off and destroys the fine surface given to the castings by the fine molding sand and blacking, and in all foundries where first-class work is made, none but the fire backs, grates and other inside plate are cleaned in the rattle barrels. All the outside plates are cleaned by hand upon the cleaning benches, with the cleaning brush and scraps, which are used in such a way as not to scratch or destroy the surface of the casting. This work of cleaning the casting is done by laboring men and boys, and one casting cleaner is required to every eight or ten molders. The cleaning brushes generally used for cleaning stove-plate castings are made of flat steel wire that is cut into lengths of from 3 to 4 inches and made into regular brushes. These brushes are manufactured by parties who have patents on them, and they are sold in the market the same as other brushes. Some foundries do not use the flat-wire brushes, on account of their high price, but make their own cleaning brushes out of fine round wire, which is cut into lengths of from 8 to 10 inches. A sufficient number of these pieces are bunched together to form a brush of any desired size, which is held together by a binding wire, which is tightly wrapped around the center of it, so that either end can be used as a brush. Still other foundries make their wire brushes by cutting the wire to the desired length and dipping the one end of the brush into a ladle of molten iron, so as to heat the ends of the wires and bind them all together with the molten iron that adheres to them. Either of these ways of making a cleaning brush makes a very good brush, but the wrapped brush is the best, for the heating of the ends often takes the temper out of the wire, and when the brush is used a short time the wires bend up on the ends and destroy the brush. The scrapers used for cleaning castings are made of old files which are drawn down like a chisel at the end, and at about 2 inches from the end the file is given a square bend sideways to form the scraper. For some pieces the file is drawn down at the end and used straight. The rattle barrels and these brushes and scrapers are about the only tools that are used in cleaning stove castings, and as fast as the castings are cleaned with them they are taken by the casting wheelers from the cleaning room to the mounting room, where they are all piled upon the racks or shelves until wanted for use in mounting stoves or filling orders for old plates.

### STOVE-PLATE MOLDERS.

The molding trade, like almost every other trade, is divided into different branches. An apprentice boy when learning the trade, only learns one branch of molding, so that the molders are divided into dry sand, green sand and loam molders, and in turn the green-sand molders are divided into

machinery molders, stove-plate molders, hollow-ware molders, snap molders, &c. A molder who understands one branch of the business, and is a first-class molder at that branch, in the majority of cases knows nothing about the other branches of the business, and could not mold a single piece properly that did not belong to his branch of the business. This is more particularly the case in stove and hollow-ware molding than in any of the other branches, for in stove and hollow-ware molding every point of the mold must be rammed just so, and each piece must be gated, vented and poured just exactly right or the casting will not run, or it will be so heavy or crooked that it cannot be used even if it does run. In any other branch of molding the ramming and gating of a piece is not nearly so important a matter, for in a heavy or very small, light casting the ramming or gating of a piece has but very little effect upon the casting, so far as the warping or twisting of it is concerned. When ramming a mold for a heavy or very small casting, the only thing necessary is to ram the sand so that it will resist the pressure of the molten iron in the mold, and when gating a heavy or very small piece it is only necessary to arrange the gates so that they will run the casting and keep up the shrinkage. To learn stove molding so as to be a first-class stove-plate molder requires long experience, yet by many machinery molders stove-plate molding is looked upon as a kind of side show to the business. They imagine that they could make stove plate as easily as rolling off a log, and they could even teach stove molders how to do it. So far as these machinery molders wrong in their imagination that there is not one of them in fifty who could possibly make a bottom oven plate (the plainest piece in a stove) so that it would be of the proper shape and weight. There is not one of them in ten who has worked at machinery molding for ten years who can ever learn to become a first-class stove-plate molder. A regular stove founder would rather at any time employ a green apprentice boy than a first-class machinery molder to mold stove plate. The time that an apprentice boy is required to serve when learning stove molding is from three to four years, and the number of apprentices employed in each stove foundry where the molders' union have control is one apprentice to every eight molders employed, and one apprentice for the shop. In foundries where the molders' union has not got control, more apprentices are employed in proportion to the number of molders. It is very seldom, however, that more than one apprentice is employed to four or five molders. In some foundries even the number of apprentices allowed by the molders' union are not employed, for the founder cannot make money out of an apprentice boy the first year, and some of them will break more patterns and burn out more flasks the first year than the profits made on them in the next two or three years will pay for. The amount of wages paid to apprentice boys differs a little in different localities and in different sized foundries. In small foundries they are employed by the year, and for the first year they receive their board and about \$25 in money; for the second year, \$50; for the third year, \$100; and for fourth year, \$200. In large foundries they get about what pays their board the first year, and after that they are put to work by the piece, and receive from 15 to 25 per cent. less per piece than a journeyman molder would receive for the same piece, so that after the first year their wages depend entirely upon their abilities. Their work is examined and discounted the same as the work of the regular molders is. This way of working and paying apprentices is decidedly the best, for it makes them take more interest in their work, and makes faster and better molders of them.

In some stove foundries each molder has a man or boy to help him riddle and shovel the sand into the flasks, and ram up the drag part of the flasks. These helpers are called "buckshires," and are always paid by the molder, who gives them from 20 to 30 per cent. of what the two of them earn, while the molder gets the balance for his work. This gives the molder the lion's share of the wages, and a molder with a good helper can always earn from 20 to 30 per cent. more wages than he can without a helper. The employment of helper makes less work for the molders, and throws a great many of them out of employment. For this reason the working of helpers has been stopped in the majority of stove foundries. Helpers are considered foundry laborers, and very few of them ever get to be journeymen molders except in case of strikes, when many of them take floors and become molders.

Stove-plate molders differ in many respects from any other molders, or any other class of workmen, for they always seem anxious to put up as large a day's work as they possibly can, so as to make large wages. Yet it does not make any difference whether they have a steady job or are only "skinning the cat" (and don't know how soon the cat will die), they are always ready and willing to take a day off on the slightest pretext of their own making. If a molder wishes to take a day off he will seldom tell the foreman the night before that he wishes to take off the next day, but he will go to the foundry in the morning all ready for work, and try to get all the other molders to take a day with him. If a molder does not feel like working in the morning and wishes to go home, he will never tell the foreman that he wishes to take the day or put on his coat and go home, but he will go round and talk to the other molders until he gets them behind with their work and in the notion of taking a day, too. They go and talk to others until they get half the molders in the shop in the notion of taking a day for going a fishing, for example. Then they will watch their chance when the foreman is out,

\* In all large stove foundries where the stoves are cut up and a large number of molders are employed, some of them are off every day. In order to keep the pieces of the stoves even, a certain number of molders are employed by the day, and are put to work on the floors where a molder is off. This way of working is called "skinning the cat," and if there are none of the regular molders off, there is no cat to skin, and the day molders must go home. Molders do not like to work "skinning the cat," and they only do it until some molder quits and they can get a steady job.



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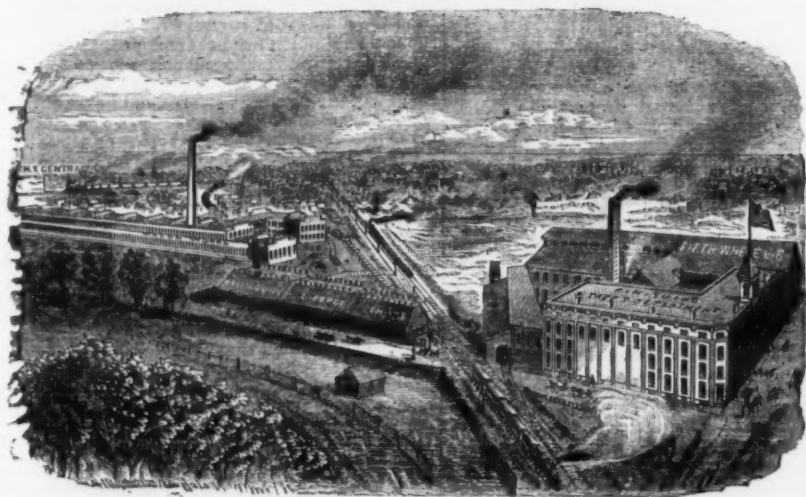
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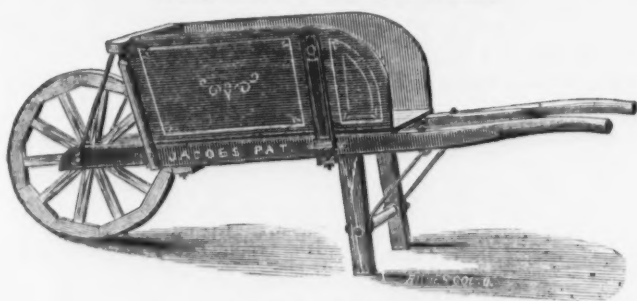
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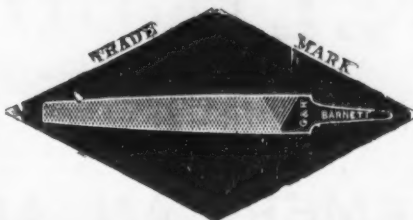
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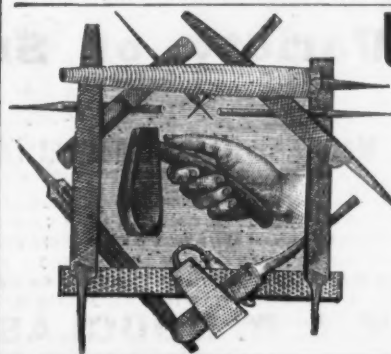
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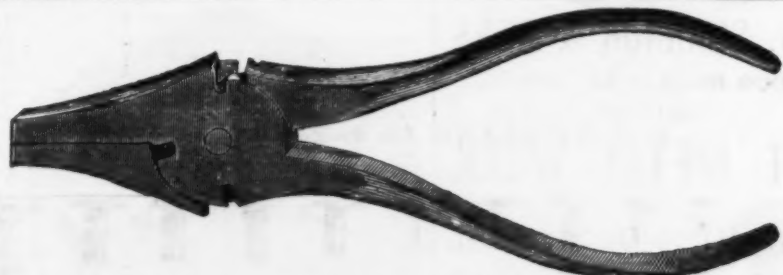
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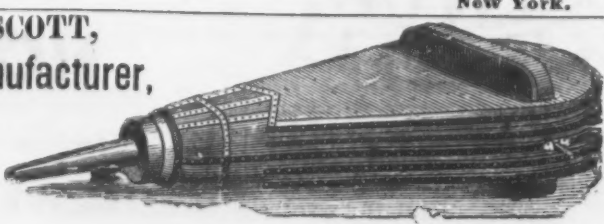
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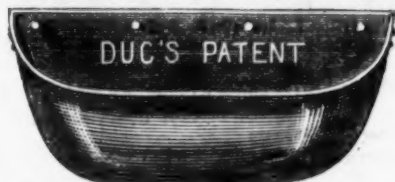
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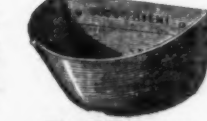


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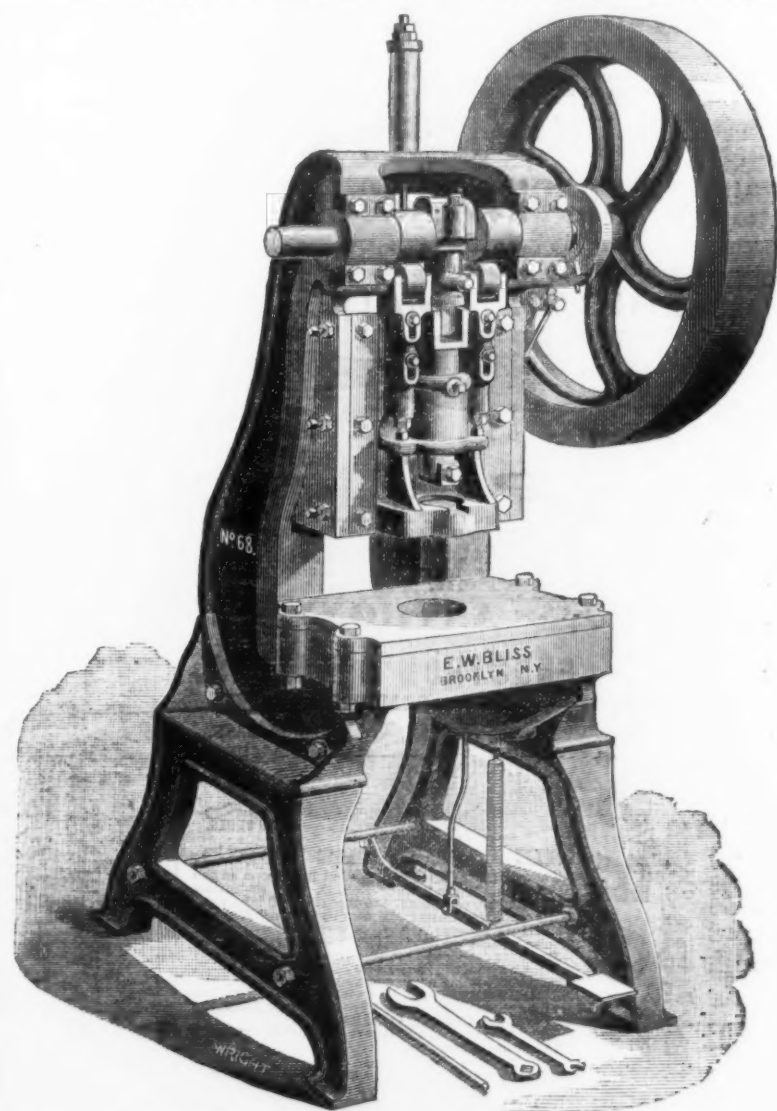
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and all put on their coats and take their dinner buckets and slip out the back way and go home. The balance of the molders who want to work will say that there are not enough men in the shop to run a heat. So they put on their coats, one after another, and slip out. It often happens that the foundry will be full of men, all apparently hard at work at 8 or 9 o'clock in the morning, and if the foreman goes out, and is gone 15 or 20 minutes, he may return to find not a man in the shop. This way of going to work in the morning and working one or two hours and then going home is a great loss to the founder, for he has to get up steam, and all the laborers and day workmen are put to work and must receive pay for their one or two hours' work or be kept at work, whether the molders work or not. About a stove foundry there is only a certain amount of laboring work to be done, and every hour that a laborer works when the molders do not work is only a killing of time and a dead loss to the founder. The stove foundries over the country have tried every imaginable way to break up this habit of working one or two hours in the morning and then going home. Many of the foundries have their windows all barred up with iron bars, and look more like prisons than foundries, while others are built with only one door, and all the windows are put in up near the roof. It is no use, for, if the molders take a

means of communication. Assuming that the work will be done as quickly at St. Gothard Tunnel, the boring will take 4218 days' work, or, working at both ends, 2109 days—that is, nearly six years. The entire tunnel might, therefore, be expected to be ready for use in seven years. With respect to the cost of construction, it is estimated that, calculating on the experience and basis of the St. Gothard Tunnel, the total sum for the execution of the work would be 45 1/4 million francs. The St. Gothard cost 54 million francs. In the northern line of approach, the cost is calculated for the first two-thirds to be a quarter of a million, the last third, three eighths of a million per kilometer. This makes 21 millions. In the southern line of approach the first third would cost half a million; the second, three eighths of a million; and the third, a quarter of a million per kilometer, thus making 40 millions. The other necessary outlay in laying down the line, &c., is estimated at 9 to 10 millions, making the grand total from 115 1/4 millions to 125 millions. Of this sum, it is reckoned that France would grant 50 millions, and Italy 12 1/2 millions, so that from 53 to 64 millions would have to be raised either by the railways which would be directly or most benefited, or by other means. The lines of approach are far more easy than those connected with the St. Gothard, though, of course, less easy



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notion to go home they will get out some way; and they are just like a lot of sheep, when one makes a start they all follow, and they always arrange things so that the boss can never find out who first makes the start for home.

### A Tunnel Through Mont Blanc.

The French government has for some time past been contemplating the construction of a great railway tunnel which should bring Paris and the Northern parts of France into more direct communication with Italy than is afforded by the existing tunnel through Mont Cenis. The projects proposed include a tunnel through Mont Blanc, and another through the Simplon or the Great St. Bernard. The last of the three has found very few friends, but it appears likely that both the former projects will be carried out. The projected Simplon Tunnel is 60,719 feet in length, while that through Mont Blanc is 44,292 feet. Comparing these with the other Alpine tunnels, we find that the Mont Cenis is 40,093 feet, and the St. Gothard 48,952 feet long. The Simplon would, therefore, be the longest of all; but this is compensated for by the fact that it is at a much lower level than the rest, the entrance at Brieg being only 2333 feet, and that at Isello 2253 feet above the sea level. The entrances to the Mont Blanc Tunnel, on the other hand, would be 3345 feet at Montquart, and 4215 feet at Entrèves, above the level of the sea. The Bardonnèche entrance to the Mont Cenis Tunnel is 3970 feet, and that at Modane 3709 feet above sea level; while in the case of the St. Gothard Tunnel, the northern entrance at Goschenen is 3633 feet, and the southern at Airolo 3756 feet above the level of the sea. Thus, the Mont Cenis Tunnel is shorter, but 330 feet higher, than the Mont Blanc, while the Simplon would be almost half as long again, but would be about 1000 feet lower.

Since the execution of the Mont Cenis Tunnel, the piercing of the Alps or of any other range has become simply a question of time and money. M. Chandon, in his pamphlet, "Le Percement du Mont Blanc," underestimated the difficulties of the work. But in M. Bérard's brochure, "Mont Blanc et le Simplon considérés comme Voies internationales," the estimate of the magnitude and cost of those undertakings was sufficiently correct, and he showed that France could not afford long to do without these

than those required for the Simplon Tunnel. By this line the distance between Paris and London and Brindisi would be shortened by 23.9 miles, but the greatest benefit France and Italy would reap from it would be the large additional facilities the tunnel would offer for commerce between the teeming populations of the two countries.

### New Double Action Stamping and Drawing Press.

Mr. E. W. Bliss, the successor of the firm of Bliss & Williams, corner of Plymouth, Jay and John streets, Brooklyn, has just brought out a new low-priced double action press, which seems likely to meet a very decided want. It is adapted for cutting and drawing blacking boxes, ointment boxes, baking powder and spice-can covers, and similar work calling for a double-action press. The range of work is pretty large, considering the fact that the press is a small one, costing about one-half as much as the smaller sizes of drawing and stamping presses heretofore made. The following are the limits of the work: 3 inches in diameter and 1/4 inch deep, 4 inches in diameter and 3/8 inch deep, and 5 inches in diameter and 1/2 inch deep. The dies are fitted on the same plan as the "Blacking Box Press" and the "Double Action Foot Press" by the same maker, and parties having either of these presses can use their dies on this without change. The weight, complete, is about 1500 pounds. It has a round spring in the bed, 6 inches in diameter. The distance from slide to bottom of bed, at top of stroke, is 5 1/2 inches, and the distance from center of slide, 7 1/2 inches. The cutting punch has a 1/4 inch stroke and the drawing punch 2 inch. A spring on the top of the press raises the slide, and in this way the construction has been greatly simplified. The balance wheel is 30 inches in diameter and weighs 240 pounds. The press is intended to run at 80 revolutions. Taken altogether, the press is one which will be found very desirable by those who cannot afford to buy one of the larger and more expensive presses, and who yet want something upon which light drawing and stamping can be done.

The government officers who have been experimenting with the Haight torpedo, at Newport, R. I., speak of "astonishing performances."



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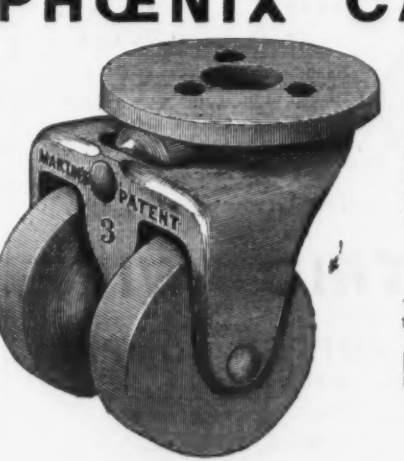
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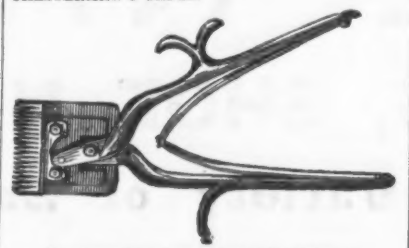


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## The Profits of Labor and Capital.

The Chicago Tribune says: The censuses of the various European States show a continuous increase of population, notwithstanding the immigration. Since 1875, the population of Germany has increased 2,500,000, making that of the empire at present 45,194,172, and the Bulletin estimates that in 1900 this population will be 60,000,000. The same paper suggests the very important question, and one of great concern to this country, whether the means for feeding these people keeps pace with the increase of numbers. From an article in *La Statistique de France* is quoted a table showing the increase in the rate of wages in France in different trades from 1853 to 1877, which table is as follows:

	Average wages per diem.	Inc. per cent.
	1853.	1877.
Jewelers.....	2.74	4.04
Butchers.....	1.73	2.84
Bakers.....	1.90	3.31
Brewers.....	2.80	3.33
Brickmakers.....	1.88	2.80
Coachmakers.....	2.21	3.48
Colliers.....	1.83	2.50
Hatters.....	2.12	3.29
Carpenters.....	2.20	3.74
Blacksmiths.....	2.06	3.22
Hosiery.....	1.80	2.45
Shoemakers.....	1.68	2.76
Cutlers.....	1.80	2.83
Slaters.....	2.16	3.57
Cabinetmakers.....	2.30	3.36
Tinsmiths.....	2.04	3.08
Watchmakers.....	2.41	3.86
Printers.....	2.40	3.45
Gardeners.....	1.78	2.70
Masons.....	2.07	3.28
Painters.....	2.20	3.10
Barbers.....	1.35	2.39
Plumbers.....	2.15	3.12
Bookbinders.....	1.92	2.82
Sawyers.....	2.01	3.20
Saddlers.....	2.14	3.11
Locksmiths.....	2.16	3.28
Tailors.....	1.96	3.03
Tanners.....	2.01	3.01
Upholsterers.....	2.10	3.53
Dyers.....	1.94	2.85
Workmen (laborers).....	1.57	2.67
Weavers.....	1.43	2.33
Coopers.....	1.98	3.02
Turners.....	1.94	3.01
Glaziers.....	2.06	3.05
General average.....	2.06	3.14

The increase in wages during these 24 years has averaged 52 per cent., and the increase continues. The same rise in wages has been general in all the States of Europe—in some places greater and in others less—and the rise continues to this time. There are two facts noted as having special reference to this rise in the price of labor. The one is that the price of bread has remained stationary, and the other is that the increase of wages has been greater in those trades in which machinery has been introduced.

In a recent article by Mr. Edward Atkinson, of Boston, he points out that during the 10 years from 1870 to 1879, inclusive, there was a saving in the cost of transportation of merchandise, which largely enters into the cost of the articles, as compared with the rates charged from 1866 to 1869, inclusive, equal to \$1,200,000,000 in gold coin. He computed the values of certain quantities of the several kinds of breadstuffs, and also of beef, pork, butter, lard and wool, and ascertained that the values of these articles in 1869 in New York aggregated \$632.68, and in 1880, \$631.32. The cost of moving this quantity of articles of food was, in 1869, \$185.84, and in 1879 was \$61.62, a difference of \$124.22. Thus, while the cost of transportation was largely reduced, the price of food was substantially unchanged.

Thus, the fact that the price of food has remained stationary in France has been confirmed by the experience in this country, and the probability is that, unless there be some extraordinary cause, the prices of food will continue to maintain their present average. The immense increase in the production of this country is met by the corresponding increase of consumption abroad and at home, which is rendered possible by the regular increase in wages, or the means in the hands of the people to purchase the food. This renders it almost certain that the policy adopted in the Continental States of Europe of taxing articles of food imported from America, thus diminishing the purchasing power of wages, will necessitate an immediate and compensating increase of wages. No people will ever submit to any reduction of the quantity of their food to which they have become accustomed.

The improvement of the working classes of Europe, consequent upon the introduction and application of steam machinery, is of itself a refutation of the theory that human life has been sacrificed by the avarice which substitutes steam and iron for human labor. Instead of placing the workman more in the power of the employer, it has made him more essential to the employer. Machinery has reduced the cost of production; has thereby increased consumption, and by increasing consumption necessitated an increase of production and of labor. The increase of wages has increased the interest of labor in its product. With increased wages the workman is encouraged to improve his condition and that of his family by education and by a general advancement in all things. In the general improvement of his class the differences in social ranks are gradually removed, and it leads up to a broader equalization of the rewards for industry, skill and frugality. The increase of wages consequent upon the increase of employment and in the employment of skilled labor indicates, as is suggested in the article from which we have quoted, that labor, being more essential than ever to capital, is gradually receiving, by the process of inevitable laws of compensation, a greater proportion of joint earnings of capital and labor, and this is shown in the reduction of the rates of interest in the world over. This fact is also shown in the figures we have quoted from Mr. Atkinson. The prices of certain quantities of certain articles of food in 1869 and in 1880 amounted in New York to within a few cents of the same sum. Owing to the reduction of the cost of transportation, the same weight of the same articles was delivered in New York in 1879 for \$61.62, against \$185.84 in 1869. The difference, \$124, was that much additional compensation to the labor on the farm, so much additional to the share of the \$632 which fell to the farm, and so much less of the \$185 which in 1869 was taken as the share of the capital employed in transportation. Take any of the joint productions of

labor and capital and it will be found that the greater the employment of machinery the lower the cost of production; the lower the cost of production, the greater the demand for consumption; the greater the demand for consumption, the greater the demand for labor, and the greater the wages of labor; and though the article produced may be sold to consumers at much less price than before, the profit on the increased production is so much greater that both capital and labor are more prosperous, and the share falling to labor is more equitably proportioned. There may be exceptional cases, but this rule may be regarded as generally verified by facts.

## Durability and Economy of Manganese Bronze.

A correspondent of the *Engineer*, Mr. P. W. Parsons, states that manganese bronze, made by him with the aid of ferro-manganese, showed excellent results when tested in presence of a representative of the British Admiralty. All bars, those of manganese bronze as well as those of gun metal, were 1 inch thick and 12 inches between supports. With a steady pressure applied in the center the gun-metal bars broke with 2912 pounds, but it required 6048 pounds to break the manganese bronze bars, and they sustained nearly one ton before any permanent set could be detected. Steel bars subsequently tested took a permanent set with about 10 cwt., though the ultimate strength was about the same as the manganese bronze. The same bars subjected to impact gave the following results, the distance between supports being the same, viz., 12 inches, and the weight 50 pounds dropped on the center of the bar from a height of 5 feet. The gun-metal bars broke with seven to eight blows, the manganese bronze bars sustained from thirteen to seventeen blows, while the steel bars broke with only three. The ultimate bend of the manganese bronze bars was in each case in excess of the gun-metal, and about four times that of the steel. These tests, says Mr. Parsons, determined the Admiralty to adopt the manganese bronze for the propellers of the Colossus, the castings of which are now nearly completed, and it has also been extensively adopted for propellers in the mercantile marine, as well as in various parts of the engines and for machinery generally. The advantages which manganese bronze possesses over steel are as follows: First, the blades can be made very considerably thinner, the surface is beautifully smooth, and the form of the blade is preserved true to its theoretical shape, whereas in steel the surface is rough and the form is always distorted by the annealing process they have to undergo. These advantages certainly increase the speed of the vessel; but another important point is their durability and ultimate economy. The life of a steel blade does not average more than three years. Some must be replaced in less than two; this is in consequence of the pitting and corrosion to which they are subject, whereas the manganese bronze blades are in this respect practically indestructible. The cost of the bronze blades is about double that of steel, so when at the end of three years the steel has to be renewed the cost would be the same as if the bronze blades had been adopted in the first instance, but every three years after that there is the additional cost of a new set of steel blades; whereas if the bronze blades are used there is none during the life of the vessel, and when the time arrives for the vessel to be broken up the bronze will always fetch 7d. or 8d. per pound, while the steel is practically valueless.

## The Mexican Oriental Inter-oceanic and International Railroad Company.

Articles of association of the Mexican Oriental Inter-oceanic and International Railroad Company have been received by the Secretary of State, at Albany, and have been laid before the Governor for approval. The articles state that on June 7, 1881, a contract was entered into by and between the Republic of Mexico and the International Railway Improvement Company, granting certain rights and powers, with a subsidy, in aid of the construction and operation of a railroad and telegraphic branches within the republic, and the contract provided that said rights and powers could be transferred to one or more companies which might be organized for that purpose. The International Railway Improvement Company does not contemplate the permanent maintenance and operation of a railroad and telegraph, as in and by the contract required, but only the construction of the same for other companies or individuals in the State of New York, having expressly authorized the incorporation of companies for the permanent maintenance of railroads and telegraphs beyond the limits of the United States. Jay Gould, Russell Sage, Sidney Dillon, Norvin Green, John F. Dillon, Thos. J. Eckert, M. Dodge, of New York; Ulysses S. Grant, and Francis De Gress, of the City of Mexico, with others, have formed the above-named company. The company is to continue for a period of 99 years from date. The road is to commence at a point on the Rio Grande between Laredo and Reynosa, continuing south between longitude 1 deg. west and 2 deg. east of the meridian of Mexico, touching at San Fernando and Santander, joining with a branch road from thence to Ciudad Victoria, to be extended as far as San Luis Potosi; also branches to Matamoros and the bar of Jesus Maria. In case this port should be opened to the coasting and foreign trade, the trunk line shall continue from Santander Jimenez to the City of Mexico, by the most convenient ascent, to the table lands, and may continue from there to a point on the Pacific coast situated between the meridians 0 deg. and 6 deg. west longitude of the capital of the republic. The main line may divide or branch off before its ascent to the table lands, passing by Papantla and Mazatlan, with its terminus in Vera Cruz, with branch roads to Soho, La Marina, Tampico, Tuxpan and Teolutha or Nautla.

The amount of capital stock is placed at \$25,000,000, divided into 250,000 shares of \$100 each. The above-named persons are to act as a Board of Directors. Jay Gould takes 100 shares; Sidney Dillon, 100; Rus-



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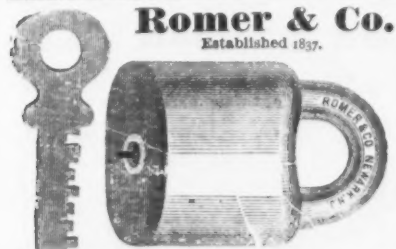
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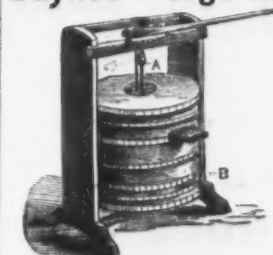
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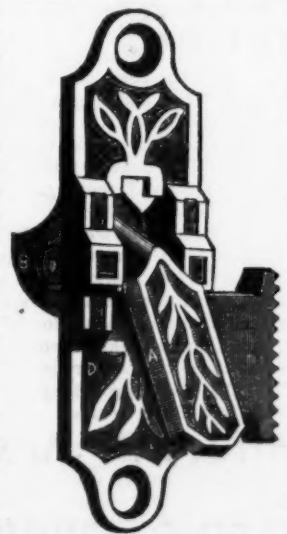
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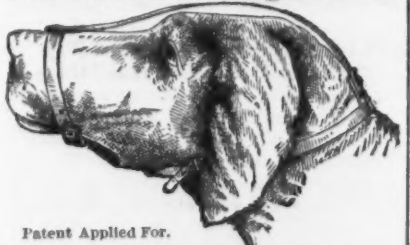


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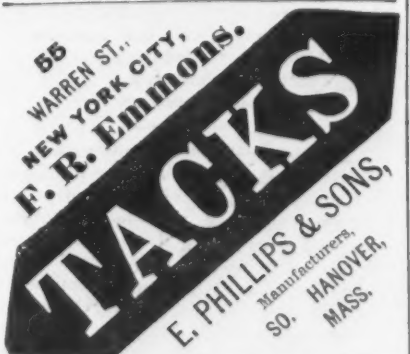
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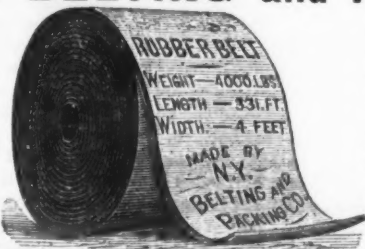
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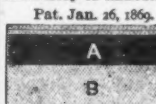


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## Recent Consular Reports on American Commerce and Trade.

Below are given extracts and statements from recent consular reports.

Consul Robinson, of Matatave, Madagascar, writes: "American trade is still so nearly restricted here to brown cotton and kerosene oil that I must report what I have reported so many times, and written to so many merchants and manufacturers in response to their inquiries, i. e., that it is not because there is not demand for other American productions, but simply because there are no facilities for getting any other goods from the United States. I am being asked almost continually, and by nearly all classes, including mechanics, agriculturists, trades and even the officers of the government up to the Prime Minister, if I can put them in the way to get such and such articles from America, and I am forced to reiterate the same reply to all: 'Our merchants at present engaged in the Madagascar trade do not wish to deal in other lines of goods than those they now handle, and they will not incur the expense of vessels with goods for other parties.'"

Consul Fish, of Tunis, says: "The few American goods that find their way to this market are shipped first to some European port, and thence transhipped to Tunis in French or Italian vessels. A good deal of American petroleum is finding its way to this market, and the trade in this article is likely to become much more important in the near future if it is wisely managed. I have not only a willingness, but a desire, to encourage the introduction of our style of goods, but as there is no direct communication by ships between the ports of Tunis and those of the United States, merchants are unwilling to run the risk of competing with European goods that now hold the market. Could a direct line of American steamers be established between the United States and the ports of Tunis, it is believed that American cotton goods and other manufactures could be profitably introduced here. Many of the articles known as 'Yankee notions' would find ready sale here, and the superiority of many of our manufactured goods over the cheap and inferior European articles would be sure to win them a place in every well regulated store."

Commenting on the importation of bonded goods into Mexico, Consul Sutton, of Matamoros, says that for the year ending September 30, 1880, the direct importations at Brazos were over 57 per cent. of the whole bonded trade of the United States to Mexico. "The main cause of this increase of direct importations and decrease in imports from New Orleans, New York and Galveston," says Mr. Sutton, "is the high freight rates charged by the only steamship line running from the Brazos to those ports. While this is the main reason, there is also occasionally some delay in getting goods through New Orleans and New York custom houses, and in the latter, it is said, small quantities are sometimes abstracted. If the goods be open for examination the interior tin or zinc case is cut, and the insurance thereby affected if the goods suffer any damage in their transit from the port where inspected to the point of final destination. These disadvantages are trifling when compared with the facility and promptness with which orders could be filled in the United States, and whenever prices and freight rates in and from New York and New Orleans are nearly as advantageous as those in and from Liverpool and Bordeaux, this trade will change back to the United States."

Consul Willard, of Guaymas, Mexico, reports that "during the past six months 8430 tons of machinery, general merchandise and railroad supplies, besides 1,850,220 feet of lumber, have been received at this port on American vessels, valued at \$464,324, of which \$111,800 worth and about 1,000,000 feet of lumber were for the railroad company. The consular district produces no lumber, and the supply is received entirely from the United States."

Discussing the differences between European and American packing, Mr. Logan, United States Minister resident in Central America, indulges in the following pointed observations: "All European merchants excel those of the United States in the item of packing, but those of France have almost made it a fine art. They employ regular packers in all establishments of any pretension, who have learned the business as a trade. The box is made of a peculiar white wood, which is close grained, exceedingly tough and very difficult to split. These features enable them to make boards of the box about one-half as thick as the American pine box, and about one-half the weight, or even less. The box is put together with a round wrought wire nail, which is very difficult to draw out of the wood. Goods are packed in sealed tin cases, which are put inside the wooden box. This latter is then securely banded with iron straps. This box weighing greatly less than the American box, an important consideration in the matter of freight bills, will stand a degree of pitching and throwing about which would tear the pine box of American merchants to pieces. The pine is not a suitable wood for boxing. It has no toughness, will not hold a nail and easily splits. To make the matter worse, our merchants use a cast-iron nail, easily broken, and more easily drawn out of the wood by reason of the loose texture of the latter. To cap the whole business, the strap of wood or iron is often dispensed with by the American merchant, and goods are sent out in a heavy pine box, loosely nailed together, to stand the racket of steamships, launches, railroads and the primitive wagon roads of mountainous countries like Central America. The inevitable result of it is that the loss by breakage and stealage in the American box is so great that a little experience satisfies the foreign merchant that he cannot buy goods in American markets."

Consul Roosevelt, of Matanzas, Cuba, contributes the following interesting information:

"It seems not impossible that within a comparatively short time changes of importance may occur. The Spanish government is alive to the urgent necessity of doing something to alleviate the general distress here, and the proposed measures are numerous and varied. One proposal is the abolition of what are called the differential flag duties, and, at the same time, a material reduction in the tariff duties. The differential flag duties, as in force to-day, are a very material and striking discrimination in favor of the Spanish flag. The removal of this, establishing a uniform duty for the goods of all nations, in whatever bottoms they may be imported, will at once put an end to the European monopoly by placing American goods on the same basis as others. In order to complete and perfect the reform the United States would have to remove the discrimination now made against goods imported there in Spanish bottoms, and as there would be a constant stream of Spanish vessels to the United States, the low rates of freight, which they are in the habit of charging, would be enjoyed by the American exporter, as they are now by the European."

Referring to the same subject, Consul-General Hall, of Havana, says: "Cuba has become commercially a dependency of the United States, while still remaining a political dependency of Spain; the economical necessities of the island attract her toward the United States, while the origin, language, customs, religion and traditions of her people enforce her political ties toward Spain. This conflict between material necessity and sentiment is probably the principal cause of the distress now prevailing in Cuba, and it requires but little foresight to perceive that this conflict must terminate either in her complete commercial assimilation with the United States or in the ruin of her material interests and disappearance of her civilization."

## Steel Rails on the Railroads of the United States.

The following table from the last volume of "Poor's Manual of the Railroads of the United States" is of much interest, as it gives, for the first time, the number of miles of railroads laid with steel rails in this country, showing exactly in what portions of the United States they have been most extensively laid:

States and Territories.	Length of Line.	Sidings, &c.	Miles Steel Rail.
Maine.....	1,059.87	142.66	299.98
New Hampshire.....	876.19	154.38	107.45
Vermont.....	816.16	115.71	108.92
Massachusetts.....	2,128.00	1,367.24	1,382.73
Rhode Island.....	151.16	69.35	80.00
Connecticut.....	996.32	311.56	611.80
New England.....	5,959.70	2,100.31	2,678.98
New York.....	5,975.96	4,306.69	2,781.38
New Jersey.....	1,687.67	944.20	1,036.03
Pennsylvania.....	6,081.36	4,232.68	4,540.25
Delaware.....	222.64	16.00	9.20
Maryland.....	1,079.12	579.71	221.00
West Virginia.....	295.40	37.31	76.00
Middle States.....	15,335.39	10,119.21	8,665.95
Virginia.....	2,028.88	920.27	890.92
North Carolina.....	1,460.14	80.91	105.66
South Carolina.....	1,221.95	88.62	175.85
Georgia.....	2,616.60	149.23	398.75
Florida.....	414.10	20.23	339.49
Alabama.....	2,028.26	149.60	339.49
Mississippi.....	1,420.93	27.98	1.00
Louisiana.....	1,231.48	131.23	621.00
Tennessee.....	1,470.80	108.41	354.92
Kentucky.....	1,606.16	283.66	577.44
Southern States.....	15,912.31	1,900.14	3,526.63
Ohio.....	7,406.31	1,968.07	1,419.30
Michigan.....	3,607.18	1,127.84	1,200.94
Indiana.....	5,095.33	758.25	2,120.24
Illinois.....	9,383.20	1,997.02	4,984.49
Wisconsin.....	5,034.21	496.41	1,758.20
Minnesota.....	4,021.58	214.66	671.77
Dakota Territory.....	269.11	5.50	800.11
Iowa.....	2,852.00	226.98	698.44
Nebraska.....	2,782.05	300.00	895.00
Kansas.....	1,844.91	112.69	358.51
Missouri.....	3,875.19	558.44	1,999.12
Arkansas.....	591.91	28.71	1.00
Texas.....	3,219.06	182.16	401.40
Colorado.....	684.50	42.30	397.30
Western and South-western States.....	50,585.29	7,924.05	17,026.12
New Mexico Territory.....	664.70	50.00	.....
Arizona Territory.....	384.00	30.00	.....
Utah Territory.....	815.05	80.00	.....
Nevada.....	322.70	54.00	143.00
California.....	2,828.00	349.89	1,638.98
Oregon.....	588.38	50.00	.....
Washington Territory.....	274.00	20.00	.....
Pacific States.....	5,876.81	633.89	1,781.98
RECAPITULATION.			
New England.....	5,959.70	2,100.31	2,678.98
Middle States.....	15,335.39	10,119.21	8,665.95
Southern States.....	15,912.31	1,900.14	3,526.63
Western States.....	50,585.29	7,924.05	17,026.12
Pacific States.....	5,876.81	633.89	1,781.98
Total United States.....	93,669.50	21,677.60	33,679.66

The consumption of steel rails, from their first introduction to the end of 1880, has, according to Mr. Swank's statistics, been as follows:

Year.	Produced.	Imported.
1867.....	2,350	.....
1868.....	7,225	.....
1869.....	9,650	.....
1870.....	34,000	.....
1871.....	38,250	50,708
1872.....	94,070	149,786
1873.....	129,015	190,571
1874.....	144,944	100,515
1875.....	209,861	16,316
1876.....	412,464	.....
1877.....	432,169	38
1878.....	559,793	10
1879.....	693,113	25,057
1880*.....	977,592	275,000
Total.....	3,816,697	776,991
* Approximately.		

The consumption of steel rails since 1867 has therefore been at least 4,600,000 net tons. As 33,689 miles of track in the United States have been laid with these until 1881, and it is estimated that 100 net tons are required per mile, about from 3,400,000 to 3,600,000 tons are actually in the track, while 1,200,000 have been removed. It is a striking fact that the mileage of steel track is reported so low, and that nearly three-fourths of the tracks of the railroads of the United States are still covered with iron rails. For the renewal of the 60,000 mile of line more than 5,000,000 net tons of steel rails would be needed, and there can be little doubt that such renewals will largely take place during the next few years. With lower prices, our steel mills would command a large market for a number of years come, even with their present enormous capacity.



# The Iron Age

AND

## Metallurgical Review.

New York, Thursday, July 28, 1881.

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The Legislature at Albany, now happily adjourned, left a small equivalent for the expense and vexation which attended the longest session on record. The passage of the joint resolutions to amend the constitution so as to abolish tolls on the canals, was perhaps the most important act. The partial revision of the tax laws carried with it the exemption from taxation, for fifteen years, of American vessels engaged in the foreign trade, but the only new subjects for taxation are collateral inheritances and mortgage bonds. The bills taxing brokers' sales, savings banks, &c., were defeated. So was the

bill providing for an increased water supply. The bills requiring a registration of plumbers, inspection of immigrants, abolishing compulsory pilotage at Hell Gate and imposing penalties for the adulteration of food and drugs, which became law, comprise commendable features.

### The Commercial Development of the Dominion.

Statistics of Canadian commerce for the fiscal year ended with June last, show that for the first time in the history of the Dominion the exports are in excess of the imports. During that year, the exports reached a total of \$87,911,458, while the imports were only \$86,489,747. The greatest development of Canadian trade was reached in the years 1873 and 1874, when the exports and imports compared as follows:

Exports. Imports.

1873..... 89,789,932 128,010,281

1874..... 89,351,928 128,213,582

Since then Canadian trade has shown an irregular falling off, but 1880, as compared with 1879, shows a gain of \$16,500,000 exports, and a little over \$1,000,000 imports.

The following table shows the trade of the Dominion with each country since 1875:

	Exports.	Imports.
Great Britain	1875..... 30,376,660	1875..... 28,717,603
United States	1875..... 27,068,999	1875..... 27,068,999
France	1875..... 1,354,065	1875..... 1,354,065
Germany	1875..... 89,948	1875..... 89,948
Italy	1875..... 44,454	1875..... 44,454
Spain	1875..... 1,100	1875..... 1,100
Portugal	1875..... 1,100	1875..... 1,100
Belgium	1875..... 1,100	1875..... 1,100
Netherlands	1875..... 1,100	1875..... 1,100
Sweden	1875..... 1,100	1875..... 1,100
Denmark	1875..... 1,100	1875..... 1,100
Prussia	1875..... 1,100	1875..... 1,100
Austria	1875..... 1,100	1875..... 1,100
Switzerland	1875..... 1,100	1875..... 1,100
China	1875..... 1,100	1875..... 1,100
Japan	1875..... 1,100	1875..... 1,100
South America	1875..... 1,100	1875..... 1,100
Other Countries	1875..... 1,100	1875..... 1,100
Totals	1875..... 89,789,932	1875..... 128,010,281

1876..... 30,376,660

1877..... 30,376,660

1878..... 30,376,660

1879..... 30,376,660

1880..... 30,376,660

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1937..... 30,376,660

1938..... 30,376,660

1939..... 30,376,660

1940..... 30,376,660

mental in securing its adoption, does not appear from any evidence yet furnished by statistics. Sir Leonard Tilley, in his budget speech at the last session of the Dominion Parliament, said: "In 1874-5 the importations from Great Britain were, in round numbers, \$60,000,000; from the United States, \$50,000,000; from other countries, \$8,000,000; or, 50 per cent. from Great Britain, 42 per cent. from the United States, and 8 per cent. from other countries. In 1875-6 the figures were: Great Britain, \$40,000,000, or 43 per cent.; United States, \$46,000,000, or 48 per cent.; and \$8,000,000, or 9 per cent., from other countries; in 1876-7: Great Britain, \$39,000,000; United States, \$51,000,000; other countries, \$4,000,000; or 41 per cent. from Great Britain, 53 per cent. from the United States and 5 per cent. from other countries; in 1877-8: From Great Britain, \$37,000,000; United States, \$46,000,000; other countries, \$5,000,000; or a percentage of 41 from Great Britain, 53 from the United States and 5 from other countries. In 1878-9 the amount from Great Britain was \$30,000,000, from the United States \$43,000,000, for the great bulk of the imports that were brought into the country in February, 1879, came from the United States, such as gray cottons, refined sugars and a number of other articles. "In that year we imported from other countries \$5,000,000, and the percentage for that year was 38 per cent. from Great Britain, 54 per cent. from the United States, and 6 per cent. from other countries. In 1879-80 we imported from Great Britain \$34,000,000; from the United States \$29,000,000, and from other countries, \$7,000,000, or a percentage of 48 from Great Britain, 40 from the United States and 11 from other countries; or, in other words, for the first time since 1874 the importations from England were in excess of those from the United States." What the people of Canada gain by changing the relative position of Great Britain and the United States as regards the percentage of exports furnished by them respectively, does not appear, but perhaps they see it. If the actual figures could be given, it might not be so evident, for there is certainly a very heavy border trade of which the official statistics take no account. The Canadian government is much less able to protect its trade against smuggling than we were at the time when it was cheaper to buy in Canada than in this country. For many years there was an enormous business in smuggling across the border into this country, and now that the conditions are changed it is quite natural that the tide should set back again. The significant remark of one of our New York merchants, to the effect that while there was not much demand on Canadian account the border trade is very heavy, tells the story. It also shows why we cannot afford to give Canada any better terms in the matter of duties than we are prepared to offer Great Britain. Such a frontier as that between the United States and Canada cannot be adequately protected against smuggling, especially on the Canadian side.

### Subterranean Telegraphs.

The demand for underground telegraph wires that followed the sleet storm of last winter has apparently subsided. "Out of sight, out of mind." The iron network, no longer dangling in the faces of our citizens, has ceased to occupy their thoughts. Yet the telephone alarm fails of response, and messengers do not always answer signals from the district telegraph instrument. The irate subscriber charges all to inattention at "the office" and wonders why he should be the particular mark for neglect. But patient, long-suffering superintendents who, day after day, with smiling faces ring changes of "explanations," know that the straining of every nerve of their employees cannot bring about anything like satisfactory results. The slender iron conductor once beyond the office roof must thread its way over an almost trackless waste until it finally drops to the subscriber's instrument. This field of roofs is apparently everybody's land. A dozen companies build and rebuild daily over and under another's wires. Interruptions and annoyances are endless and without remedy. Owners of buildings sometimes charge damages, sometimes rental for occupancy, and, again, refuse all offers, and when swept off by determined landlords telegraph linemen light, like flies, on the nearest quiet spot. It must be understood that the telegraph companies have absolutely no rights upon roofs. Each property owner in theory controls and has absolute ownership from the earth's center upward into unlimited space. Crossing a man's property a hundred feet in the air would very probably be found to be a trespass as much as though on the ground. Upon the roofs or over them the companies are, in general, squatters, liable to dispossession at the whim of the owner or tenant.

In erecting pole lines, the legal rights of companies are more settled, but they dislike the popular indignation thus aroused. The owner in front of whose door or window a pole is planted, very likely becomes an enemy of the company setting it. Rather than live on in this precarious fashion, one would suppose that experiment and research upon the subject of underground telegraphy would be energetically promoted by the companies; but we cannot ascertain that such is the case. A few persons, however, have given the subject serious attention. The following plan, combining what we judge to

be the best features of all, is submitted for consideration: Conducting wires, well covered with cotton and bound into bundles, are sufficiently insulated from one another, provided their surroundings are dry. If protected by a good quality of gutta-percha, insulation can be maintained if the conductors are constantly submerged. Subterranean lines are under neither of these conditions. Cotton becomes saturated with moisture; gutta-percha grows friable, disintegrates and falls from the wire. This point may be met by winding copper wire with thoroughly dry cotton, and treating it with tar from which all ammonia has been extracted. This preparation will exist for an indefinite period and form a good insulator. In English and American patents of different dates are full details for easily manipulating the wires during original construction and for future charges or repairs. It is proposed to build vaults—or, more properly, perhaps, manholes—short distances apart, and connect them by conduits or channels. These conduits contain series of continuous earthenware pipes reaching from vault to vault. There is nothing expensive in the material, and ample provision may be made for future use at the time of laying. Through these pipes are drawn flexible cables perforated lengthwise, each perforation containing an independent wire. The cables can be drawn through by means of ropes laid in the pipes at time of building, or if that has been neglected, by pneumatic suction or propulsion; workmen stationed in each vault can thus manipulate the wires without disturbing the soil above. A greater number of wires can be placed within one foot square than are accommodated by the largest pole line in the city. A single wire can be drawn out, repaired and replaced, without disturbing in the least any other conductors of a group.

One great difficulty with telephone wires in close proximity, is disturbance arising from induction or the influence which one charged conductor exerts upon another lying parallel and near. The result is that conversation on one wire can be heard on others if the conditions are as just stated. These troubles can be easily remedied. A thin metallic covering (as tinfoil) over the insulation of each conductor neutralizes inductive effect to a certain extent. As inductive action between parallel wires increases directly as their length, it is quite evident that in a group—say, of twenty wires—a change of relative position will serve to break it up in distances too great to be overcome by the metallic screen. As to practical results, we should say that twenty wires running parallel for a distance of 2000 feet, each surrounded by a thin envelope of metal, will not seriously interfere. Changing their relative positions in the flexible cable every quarter mile or thereabouts in some convenient vault is not a serious or difficult matter. By means of proper apparatus in the manholes the branching and crossing of the wires withdrawn and replaced, wires divided into large or small groups, branched into buildings, and all the other necessary manipulations accomplished. There are several patents which cover means for keeping the vaults dry, and others for keeping the conduits or tubes dry, without paying much attention to the manholes themselves. There is also an elaborate and most useful method of keeping records and diagrams of the positions of the conductors, and of recording the position of each individual wire. This same patent also covers a means for marking each wire at every point at which it is accessible.

At the present time the telephone companies are cut off from some territory which would be most valuable, simply because they find no way of getting wires into it without creating the greatest hostility. Poles are out of the question, even though the legal right of way could be obtained. Crossing roofs is equally impossible. Under such circumstances it seems to be wise to consider carefully the schemes presented for putting the wires conveniently under ground.

### Freight on Lake Superior Ore.

The *Bulletin* of the American Iron and Steel Association copies our editorial on English, French and American coke, ore, &c., but credits it to another journal, in which it was copied. Commenting on our figures of freight on Lake Superior ore the *Bulletin* says:

The *Cleveland Trade Review* for June 15th stated that "freight contracts have been entered into from Escanaba to Cleveland at \$1.50 per ton. Freight from Marquette are quoted at \$2." The *Chicago Inter-Ocean* for July 12th states that contracts to carry ore from Escanaba to Cleveland have been made at \$1.50 per ton. These rates are lower than those which the *Coal Trade Journal* gives above.

Our statement was as follows: It is well-nigh impossible to arrive at the cost of transportation on our ores. The transportation on Lake Superior ore to Pittsburgh will average \$5.50; to Cleveland, from \$2 to \$2.50 less than this. To Chicago the average will be \$2 to \$3. In the East the rate varies greatly, but we should judge that the average will not be less than \$2 a ton. Mr. Bell in 1875 estimated that it cost the Cleveland (England) blast furnaces about one-half as much per ton of pig iron for freight as it cost the Pennsylvania furnaces.

Both statements are correct. The figures given by the *Trade Review* and the *Inter-Ocean* cover only the rate from the docks in the Lake region to the docks at Cleveland or Chicago. Our figures include not only this, but the rates from the mines to the docks. Add the Lake Superior rail freights and the Lake freights together, and our average of

\$3.25 to \$3.50 for freight from the mines to Cleveland, Ohio, will not be far out of the way.

### The Negro as an Iron Worker and Miner.

In many sections of the South there has prevailed from time without mind an idea that the negro never could become a skilled ironworker. He had worked very successfully about furnaces, but in the skilled positions about the rolling mill—as a puddler, a heater or a roller—it was fully believed that he could not become a competent workman. In this fact will be found one reason why before the war there were so few mills in the South, and one reason why they have not increased more rapidly since. While this has been the prevalent and well-nigh universal belief, it has not been shared by all Southern iron manufacturers. For some years a portion, at least, of the workmen at the Old Dominion and Tredegar Iron Works, at Richmond, Va., have been colored men, and as puddlers they have been especially efficient. Some years ago, during a strike at a mill in Pittsburgh, a number of colored men were brought from Richmond to Pittsburgh as puddlers, and unless a change has been made very recently, the puddling at this mill is still done by negroes. These experiments and their results, successful as they have been, have not been generally known in the South, and when some six months or more ago the Knoxville (Tenn.) Iron Works concluded to try negro labor, it was with some doubt as to the result. To-day, we are assured, the mill in all of its departments is run entirely with negro labor—puddling, heating, rolling, shearing, &c. The superintendents are white, but heaters, rollers, roughers, catchers, drag downs, puddlers, helpers, &c. are all colored. At the Atlanta (Ga.) mill a similar course has been pursued for about two months. The puddling is done by colored labor as well as it was done by white, and as soon as men are taught, the remainder of the work will be done by them. In every case, we are informed, the negro workmen are as efficient as the white.

This movement, and what is likely to result from it, is of more than ordinary importance to the iron works of the country, and especially in the South. It having been demonstrated beyond the shadow of a doubt that negroes do make skilled workmen about the mills, it is not at all probable that the race will allow this opportunity for improving their condition to pass. The wages earned at boiling, heating and rolling will seem 'fabulous' to men who have been working for 50 to 75 cents a day. All negroes will not make good workmen, nor will all white men, but there is no reason why the proportion of good workmen should not be as great in the one class as in the other. The colored race is teachable, imitative, physically strong, and accustomed to stand heat, and we have no doubt they will form an element in the labor question about our rolling mills that cannot be ignored.

As a miner, the negro has already entered into labor contests in the North. His value and efficiency has long been recognized in the South in the coal mines, and the well-nigh universal testimony is that, with the exception of superintendence, there is no part of the work, either of ore or coal mining, that they do not perform as well as the best. "As miners they are equal to the best Welsh and Cornish miners," was the testimony of a Welsh mining captain at a Virginia ore mine. They are as faithful and steady workmen, if not more so in many cases, their only "sprees" being the week or two of the annual camp meeting. It has not only been in the South that the negro has made himself felt as a miner, but in the North also. Several bitter strikes in coal mines have been ended by his presence. We recall, as we write, cases at Pittsburgh, and the desperate struggle and riots, resulting in death, in the Hocking Valley. Some Illinois, and we believe some Michigan and Iowa, mines have employed negroes during strikes, and they are still retained. This question of the negro cannot be treated as the Chinese question has been. He is black, but not an alien. He is a native American. He may live very cheaply; but that is his privilege. He may take the place of another and work at less rates; but that is his right, if he chooses to do so, and in a number of cases he has shown that it is dangerous to interfere with that right. The indications are that the migration of labor from the South to the North will make the negro an element in the labor question about our mills that trades unions will find it difficult to deal with in the ordinary way.

A case has been brought to our notice lately which shows the utter inconsistency of the ironworkers of this country in their views on the tariff, and the importation and use of foreign iron and steel. Some months ago a committee of nailers served notice on the proprietors of a *Weston*



this mill were inferior workmen they could do the same. But the point is the absurd inconsistency of the workmen. They prate about their attachment to the tariff system, and insist that a manufacturer has no right to use old rails or scrap or pig iron from abroad, and yet they claim the right to force a manufacturer to use foreign steel. We wonder what the Pittsburgh steel workmen who are members of the Amalgamated Association, think of this attempt to injure their business?

#### Ore per Ton of Iron.

In a recent issue, *Iron* has taken up the question of the quantity of ore required in various countries to make a ton of iron, and from an examination of statistics has reached the conclusion that the yield of the ores in the blast furnace in various countries compares as follows: England, 37 per cent.; France and Germany, 42 per cent., and Belgium, 58 per cent. The grade of the American ores is not given, but from the figures published by Mr. Jas. M. Swank, in his recent census report, we calculate it to be 52.1 per cent., the quantity of pig obtained from 7,256,684 tons of ore having been 3,781,021 net tons. While expressing some surprise at the high figure in the case of Belgium, our contemporary professes to have implicit faith in the correctness of its figures, and bases upon them a pathetic appeal to English ironmasters to pay more attention to closer smelting. Not being in possession of the data from which the figures given above are derived, we are unable to say with confidence that an error has been made. If they have been obtained by simply dividing the supply of iron ore—the sum of production and importations—into the quantity of pig made, a grave mistake has been made, as the amounts of ore used for fettling have been left out of the calculation entirely, and no account of the quantities used in open-hearth steel works has been taken. An omission of this kind would charge the blast furnaces of England with ore which had never gone to them, and the average yield would thus be depressed. So far as we are aware, there is no record of the ore used for fettling and steel making in England, but to illustrate our point we may show what difference it would make in the returns in this country. According to Mr. Swank's statistics our rolling mills used 363,959 net tons, our steel works 7327 tons, and our crucible steel works 2128 tons. As the consumption of ore on the part of forges and bloomeries, amounting to 79,610 tons in this country, is insignificant in England, we will leave it out. By making such an error in the case of the United States we would arrive at 49.5 per cent., a difference of about 2.5 per cent. If the relative quantities of ore used for smelting and for fettling in both countries were the same, English blast furnaces would show a yield of 39.5 per cent., which is by no means so far behind France and Germany as the figures of *Iron* would tend to show. There is, however, another possible source of error which we would like to feel sure of before accepting the returns given. The reports of the nine inspectors probably give the quantities as delivered by the miners; but before being charged into the furnaces a considerable percentage of the ores, notably the Scotch blackbands, are roasted. We doubt whether due allowance has been made for this, and until we are assured that it has we shall look with suspicion upon the figures given by *Iron* and reject its conclusions.

Among the many interesting statistical data gathered by Messrs. H. V. & H. W. Poor, in their Manual of the railroads of this country for 1880, those relating to the equipment of the roads are of great value. From them we learn that at the close of last year there were 17,949 locomotives, 12,789 passenger cars, 4786 baggage, mail and express cars, and 539,355 freight cars, there having been purchased during the year 865 locomotives, 780 passenger cars, 267 baggage cars, and 59,165 freight cars. We have no means of ascertaining the quantity of iron required in various forms to build this enormous addition to the rolling stock of the country, but with the figures before us can very well appreciate the effect which the enormous demand from that quarter has had upon the consumption of iron. According to all accounts the activity at the carshops indicates that this is going on unabated at the present time, and that the prospects of a continuance during the present year is assured. We know that the building of new lines of railway has even increased somewhat over last year, and there is little reason to doubt that for the five months before us in this year the railways—the greatest customers of the iron and steel trade—will buy as largely as they did during 1880 and the first half of 1881.

A curious feature in the copper trade has been the occasional reimportation of American copper from abroad. When the Lake companies sell their surplus abroad at a price much lower than that asked in this country, the transaction is supposed to be accompanied by a guarantee on the part of the European buyers not to return any of it to this country. Such reimportation is made possible and profitable by the fact that the American copper enters free of duty, and as the cost of shipment from abroad is much less than the difference in the price paid abroad and that realized here, the temptation to make money by placing it in this

market appears to be too great. In 1879 and 1880, out of 13,731,215 pounds of copper exported, 4,593,129 came back to us, and while we have shipped abroad this year about 6,000,000 pounds, we have received to date about 300,000 pounds. The aim of the companies to hold prices here is thus partially defeated. However careful they may be to sell to responsible parties, the force of any agreement to abstain from reaping a profit by reimportation is considerably weakened when the metal goes into other hands.

"Fair Trade vs. Free Trade" is the latest phrase that our English friends are using to cheat themselves and excuse their lapse from the "broad principles" of free trade. "Retaliation" had a dash of spite in it, and seemed to imply that the high moral ground on which English free traders stood was slipping from them. There is no doubt that it is slipping, but it would not do to acknowledge it, and so the free traders or those who have once loudly proclaimed free trade doctrines, cheat themselves with the phrase "fair trade." There are abundant signs that a political campaign for a modified protection is before the English people. Certain Conservative leaders are reported to have formed leagues, like our blessed grandmothers of Revolutionary fame, declaring they will neither eat, drink, nor wear anything that is raised in a State that does not have "fair trade" with England. The workingmen are earnestly agitating in favor of modified protection, and the Conservatives, being the "outs," are loudly criticizing what they term the "absolute free trade" policy of the Liberals, who are the "ins." There is no doubt the outcome of this will be some modification of the British fiscal system. There is a growing belief in England that other countries will not give up what one of their writers termed taking "an unmanly advantage of our adoption of a large and noble principle; so they propose to give up in part the 'large and noble principle.'"

Sensational letters and telegrams from the anthracite coal district report that the Molly Maguire organizations are being recruited, and have lately perpetrated two cold-blooded murders. In both cases, however, the crime seems to have been inspired by motives which a society, however organized, would probably fail to recognize as warranting the death of the offenders. There are, no doubt, a good many young thugs in the coal regions, but probably they have no organization, and could not be managed by any one. It is a great mistake to attribute every murder resulting from private animosity or jealousy to the Molly Maguires, as it encourages other crimes of a like nature. Murders and acts of violence should be dealt with as individual crimes, and not as the work of some mysterious organized power which can successfully set the law at defiance. When the impression once gains ground that the Mollys are organized and at work, every bad and unprincipled man with an enemy will consider it a good time to gratify his evil passions, in the hope that he will escape detection and the blame be laid upon some intangible and irresponsible organization whose ways are mysterious and past finding out.

A good many very loose statements are being made about a magnetic separator invented by Mr. Edison. We regret to see that that gentleman has apparently abandoned the great problem of recovering lost gold from the tailings of our Western mills, and has now determined to find millions in the sands of Long Island. We are informed that this wonderful sand "contains 26 per cent. of the finest iron known." "Titanite iron," however, has balked everybody else until now, but the ingenious Mr. Edison has modified his apparatus and now culls from the sand only the pure magnetite, at the rate of 100 tons per day per machine. We are very glad that the pauper labor of Spain and Algeria will thus be beaten by Edison, and expect at an early date to see all importations of foreign ore cease. It is fair to presume that the unreasonable mine owners of Lake Superior, who insist upon making all the money they can regardless of consequences, will be speedily brought to terms. The Western furnaceman and the Long Island real estate holder will probably see in Edison the benefactor of his race.

An interesting suit has been begun by a Philadelphia importer, who has been sued to recover \$9000 duties alleged to be due on iron ore imported into this country. The Custom House authorities claim that the ore was undervalued from 10 to 15 per cent. This the defendant denies, and has brought suit against Special Deputy Collector Isaac D. Balch for slander. This is turning the tables on the Custom House people with a vengeance, but we doubt if the suit for slander will stand, unless it can be shown, as charged, that the deputy collector was in collusion with the appraisers, and was the responsible head of a conspiracy to persecute the complainant. The case is curious, however, and importers will be interested in knowing how it terminates.

In the State Circuit Court, at Boston, on the 26th inst., the jury rendered a verdict for the plaintiff in the case of James W. Newell vs. Alanson W. Beard. This was a suit to recover \$2200 paid under protest as duty on a consignment of Swedish iron

which the Collector of that port classified and appraised as steel. The matter has been in dispute some time between the government officers and the iron and steel importers, and this was made a test case. The trial lasted over four weeks. The case goes to the Supreme Court on minor points, but the question of fact is decided by the jury's verdict.

English advices indicate that there has lately been a considerable revival in the American demand for steel rails. The *Iron-monger* announces, on what it considers authoritative information, that large orders have lately been placed. The only specific information given is as follows: "During the past few days the Central Pacific Railroad has bought for autumnal delivery at San Francisco 30,000 tons of rails. Of this quantity Messrs. Wilson & Cammell, of the Dronfield Steel Works, near Sheffield, have secured 20,000 tons, and the remaining 10,000 tons have fallen to the 'share of the Moss Bay Hematite and Steel Company, Cumberland. The exact price 'paid has not transpired, but it is understood to range up to about £6. 10/ per ton, 'f. o. b., usual ports of shipment for the 'works in question.' Why this order should have been sent abroad under the circumstances we are at a loss to understand. Nothing will be saved by importing the rails, if the price above given is correct, and we doubt if they will be had as promptly or cheaply as American mills would have furnished them.

Advices from Lima are to July 7th. The election for President in Chili took place on the 25th of June, and Dr. Domingo Santa Maria, the only candidate in the field, was quietly chosen. It was not yet known what terms of peace would be insisted upon under the new régime. The Chilians will not treat with Pierola, ex-President of Peru, and his chiefs are expected to die a natural death, if let alone. Calderon's government had been formally recognized by Mr. Christiancy, the Minister of the United States.

Negotiations are in progress looking to the establishment of Bessemer steel works at Sharon, Pa., but as yet nothing definite has been done beyond the appointment of a committee by the citizens of the place to consult with the owners of the Stewart furnaces, which are located at Sharon. It is understood that some money has been subscribed conditionally, but as yet the matter has taken no definite form.

Bradstreet's circular of the latest date gives a favorable account of the commercial situation. Advices from 37 prominent trade centers indicate considerable activity by comparison with the average observed during the dull season, and prospects for the fall are reported favorable.

English papers speak of a considerable traffic in explosive machines carried on between America and England. These diabolical contrivances are intended to give emphasis to the opinions of the Irish press.

The proposed world's fair in Boston is supposed to be in process of successful incubation. A favorable report from the committee in charge is expected soon.

#### OBITUARY.

##### Col. Milner W. Roberts.

Information was received at Philadelphia last week of the death at Rio Janeiro, Brazil, on the 14th of July, of Col. Milner W. Roberts, the eminent engineer, who has been for some ten years Chief Engineer of Public Works.

Few men have been more closely identified with the growth of the industries of Pittsburgh and Pennsylvania than Col. Roberts, and his death recalls the eminent worth of the dead engineer and his ability in his profession. His death was not looked for, inasmuch as Col. Roberts was blessed with rugged health. It is reported that the cause of his death was typhoid fever.

Col. Roberts was 72 years of age, having been born in Philadelphia in 1809. His father was Secretary and Treasurer of the Union Canal Company, and in early life Colonel Roberts was engaged as engineer on the work. His next employment was as principal assistant engineer of the old Columbia Railroad Company, and he made surveys of the Portage Railroad, by which canal boats were taken over the mountain and dropped into the canal not far from Hollidaysburg. After the completion of the Portage Railroad and the canal to Pittsburgh, Colonel Roberts was chosen engineer of the Monongahela Navigation Company, and the original surveys and works of that company were made under his direction and supervision. During the administration of Governor Porter he was appointed engineer on the Erie Extension of the Pennsylvania Canal. The canal from New Castle to Erie was completed under Col. Roberts' supervision. He was also in charge of the engineering department of the Cumberland Valley Railroad, and not long after chief engineer of the Sunbury and Erie, now Philadelphia and Erie Railroad. His next important work was on the Allegheny Valley Railroad, of which he was chief engineer, and the surveys of which were made under his direction. He severed his connection with the company after the road had been built as far as Kittanning. Afterwards Col. Roberts took charge of the surveys in connection with the construction of the Ohio and Mississippi Railroad, also the Iron Mountain road, in Missouri.

He was appointed by the government to take charge of the improvements of the

Ohio River, and made some very important reports concerning the hydrography and topography of that stream and its tributaries. He first recommended the improvement of the Ohio by means of locks and dams and open shutles, similar to those intended to be placed in the Davis Island dam. He laid out the plans for the construction of the great St. Louis Bridge, and also made most of the surveys for the Northern Pacific Railway. His last employment in this country was as chief engineer of the latter road.

It is a quarter of a century since Col. Roberts paid his first visit to South America and became interested in the public works in that country, and was given an important position in connection with Brazilian railways. After his return he remained some years in this country engaged in the practice of his profession. A few years since he was appointed chief engineer of the public works of Brazil, receiving the appointment from the emperor, Dom Pedro, at a salary of \$25,000 per year, and this position he held at the time of his death.

In personal attributes Col. Roberts was retiring in disposition and unassuming in manners, and in character the personification of integrity and honesty. At the time of leaving for Brazil he was president of the United States Society of Civil Engineers and was honorary member of a number of similar associations. He died at a ripe age, in the full possession of his rare faculties and while still in professional harness, for his indefatigable industry would not permit him to relinquish any of his labors, even after passing his three score years and ten.

##### William S. Hudson.

William S. Hudson, one of the most eminent locomotive engineers and inventors in the country, died on Wednesday night at his residence at Haledon, near Paterson, in the seventy-second year of his age. He was a native of Derbyshire, England, and served his time as an apprentice to Robert Stephenson, the builder of the celebrated locomotive Rocket, which established the success of the steam railroad. Coming to this country soon after attaining his majority, Mr. Hudson was early employed to begin the manufacture of locomotives at the Auburn State Prison, in New York; but the project was a failure, from the difficulty in securing and keeping the necessary skilled labor. He was then appointed master mechanic on the Attica and Buffalo Railroad, subsequently merged into the New York Central. From there Mr. Hudson went to Paterson, to assume the position of Superintendent of the Rogers Locomotive Works, which he has held since 1852. For the last year and a half he has been mostly confined to his home with a complicated illness, but his position has never been filled at the works, save temporarily. While in charge of the mechanical department of this establishment Mr. Hudson has made a great many improvements in locomotive construction, some of which have been patented, but most have not, while all have come into general use in the construction of engines. Some of his more notable improvements were in the building of double-ender engines with double sets of driving wheels; a balanced swing truck to enable engines to turn curves safely; steel fire-boxes; cast-iron instead of wrought-iron timbers to flues in boilers to prevent leakage, besides improvements in connection with the crown sheets of boilers, grate-bars, ash-pans, piston movements, safety valves, and scores of others. One of his great aims was always to economize in the cost of generating and in the use of steam, he estimating that scarcely half the power of the steam generated was utilized, and that here lay the great field of inventors. He was very modest and retiring in disposition, and hence but little known except in his profession, but in that he was respected wherever the locomotive is known, and was esteemed as standing in the very front rank. He was a prominent Royal Arch Mason.

##### M. W. Warne.

Col. M. W. Warne, an old and respected resident of St. Louis, died on the 21st inst., at Lawrence, Kan., where he had been stationed for some time in the management of the Southwestern Barbed Wire Fence Company. Col. Warne was born at New Brunswick, N. J., on December 7, 1810, and at the age of 21 years removed to New York city and entered the hardware trade, which was the business of his father before him, and in which he had then served an apprenticeship of nine years. After two years in New York he began business on his own account in the cedar-ware trade. He was especially fortunate, and accumulated considerable wealth, but indorsements of notes ruined him and sent him adrift. Thus situated, he concluded to go West and begin again. On arriving in St. Louis, in 1846, he commenced work at his trade, and after having amassed some money, he engaged with Henry L. Joy in the manufacture of woodenware by machinery at Quincy, Ill., at the same time carrying on a branch business in St. Louis. Just as his fortunes were being repaired the factory at Quincy was burned, and as the proprietors had failed to insure it, was a total loss. Shortly afterward his St. Louis house was swept away by the great conflagration of 1849. This house was partially insured, and on the small amount received from the insurance companies Col. Warne entered into partnership with William H. Morrill, with whom he continued in successful business for seven years, when Mr. Morrill sold out his interest to E. L. Cheever, who lost his life Feb. 5, 1857, on the ill-fated steamer Colonel Crossman. Capt. Joshua Cheever then took his brother's interest and the firm name remained unchanged until Mortimer N. Burchard was admitted, when the firm became Warne, Cheever & Co. Mr. Burchard became his son-in-law. The firm name was afterward changed to Cheever, Burchard & Co., who were succeeded by the present firm of Semple, Valle & Burchard. Col. Warne was a just, upright, generous man, greatly beloved by all who knew him.

The Irondale Case.—The District Court convened on the 19th inst. at Steubenville, Ohio, for the hearing of the famous Irondale case,

which has attracted so much attention, and in which Chicago, Cleveland and Pittsburgh parties are largely interested. The property is not worth to-day over \$40,000, yet there is over \$100,000 involved in the case.

#### The Catalan Forge in Europe.

In a lecture before the Society of Arts, Prof. A. K. Huntington describes iron making in the Catalan forge, as practiced in Spain and in the South of France, in the following manner:

The ore is crushed by the hammer, and divided by sifting into lumps ("mine") and very coarse powder ("greillade"). The furnace being still red hot from the last operation, it is filled with charcoal nearly to the tuyere; the hearth is then divided at a point about two-thirds distance from the tuyere into two parts by a broad shovel; on the blast side a further quantity of charcoal is added, while that on the other side having been rammed down firm, ore is added, so as to fill that part of the furnace; on this is placed moistened charcoal dust, except at the top. A good blast is then turned on, and if the whole is in good order, jets of blue flame at once issue from the uncovered portion of the ore. After a few minutes the pressure of the blast is lowered to 1.5 inch of mercury. At intervals during the process—which lasts about six hours—the blast is gradually raised until it reaches about 3 inches, the maximum usually employed. During the whole of the process, at short intervals, "greillade" and charcoal are added, and well moistened with water, to prevent too rapid combustion. After about two hours from the commencement, the wall of "mine," i. e., ore in lumps, is pushed well forward under the tuyere, and more "mine" is thrown into the space thus made; this part of the process is also subsequently repeated at intervals, until sufficient has been added to form a lump of iron or *masse* of the required size. From time to time slag is removed by opening the tap hole. At the completion of the process, a mass of metal is obtained, weighing about 3 cwt., which invariably consists partly of soft iron, and partly of steely iron and steel.

We have seen that in the one part of the furnace only charcoal and "greillade" are introduced, and in the other only lumps of ore. That the ore should be in lumps at that part is a very important point, for in this way the hot reducing gas, carbonic oxide, generated by the action of the blast on the charcoal, is able to pass freely through the mass of the ore, the effect of which is that the water of hydration and the moisture are first driven out by the heat, and then the ore having become easily permeable, the carbonic oxide reduces it to metallic iron. There are, however, several stages in this reduction, magnetic oxide being first formed; and protoxide is next formed before metallic iron is obtained. At the same time that these reactions are going on, the ore has become impregnated with carbon, derived from the decomposition of the gases with which it is charged. That this would be the case, the experiments of Mr. Lowthian Bell and others can leave no manner of doubt. On the tuyere side, where are placed the charcoal and "greillade," the latter, as the charcoal is burnt away, descends rapidly, and, to a considerable extent, doubtless, escapes reduction, for the arrangement of the blast is such that most of the reducing gas is projected on to the lumps of ore and does not pass up through that portion of the furnace occupied by the charcoal and "greillade," which, besides, are constantly damped. This "greillade" is much richer in silica than the larger pieces, from which it results that the quantity of slag will vary with the "greillade" added. It is always very rich in oxide of iron. Now, what happens in this process appears to be this: Carburized iron is produced by the gradual reduction and fusion of the lumps of ore, and this, coming in contact at the bottom of the furnace with slag, very rich in oxide of iron, the carbon of the one combines with the oxygen of the other, and the result is that iron containing more or less carbon is produced, according as much or little oxide was present.

The obvious conclusion would be that the less there was of "greillade" present the more steely would be the iron; in practice this is found to be the case. This circumstance would naturally suggest the total suppression of the "greillade," when it was desired to produce steel. This would, however, be impracticable, for it is necessary that some of the oxide of iron should remain unreduced in order to flux off the silica, which occurs in considerable quantity in the ore. In the blast furnace this difficulty is got over by employing lime; but lime at the temperature of the Catalan Furnace would not produce a sufficiently liquid slag.

All that can be done, then, is to employ every available means to prevent decarburization. Accordingly, we find that when steel is required, in addition to using less "greillade," the slag is tapped out more frequently, so that the lump of iron, as it forms, may remain as little time as possible in contact with it. The bank of ore is exposed for a longer time to the reducing and carburizing gases, and is pushed more gently toward the tuyere so as not to become decarburized by the air, which has not had time to combine with the carbon of the charcoal. Lastly, manganese should be present. It is found that the presence of manganese has a very important influence, which is probably due to its power to replace iron in the slag. A slag containing manganese is more liquid than if it contained iron alone, and, according to Francois, has not the same tendency to cause decarburization at the temperature of this process. In order, then, that steel may be produced by this process, every precaution is taken to cause as much carburization as possible, the unavoidable presence of oxide of iron in the slag, and the low temperature, effectually preventing the formation of cast iron—the former, indeed, making it very difficult, as we have seen, to obtain steel. It might be said, why not increase the temperature, so as to obtain a liquid slag without using oxide of iron? If the temperature were increased, cast iron, instead of steel, would be produced; in fact, that is exactly how cast iron first came to be obtained in blast furnaces.



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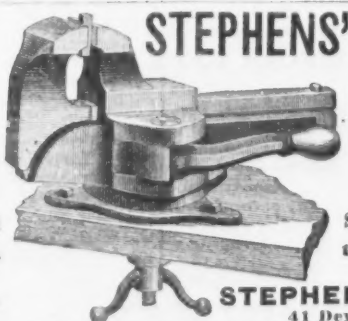
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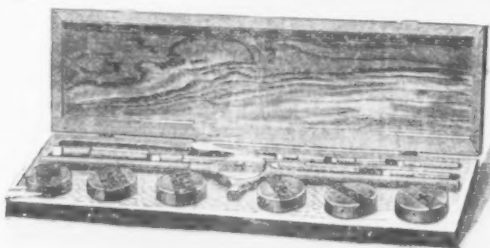
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(Also in Rolls, for machine work.)

Ground Emery, Corundum &amp; Flint, Clue &amp; Curled Hair, Hair Felt, &amp; Felt-

ing for Covering Boilers, Pipes, &amp;c., Cowhide Whips.

Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.,

NEW YORK, 67 Beekman St., CHICAGO, 182 Lake St.





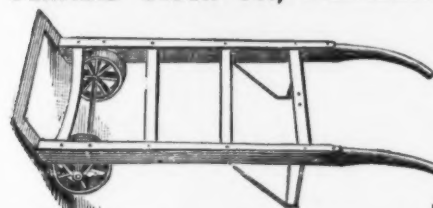
### Gentlemen.—This cut illustrates our CAST IRON Furnace Lamps

which are superceding entirely the Tin Lamps wherever introduced, in consequence of their durability. They are now extensively used in the Iron Districts of Ohio and some in Pennsylvania. We call your attention to and solicit your order for them, confidently asserting that they are an A No. 1 article in every respect.

Sample sent if desired.  
PRICE, \$12 PER DOZEN.

**Taylor & Boggis,**  
CLEVELAND, O.

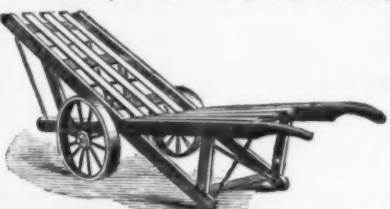
**PENFIELD BLOCK CO.,** Successors to Penfield Block Works, Lockport, N. Y., U. S. A.



Manufacturers of a Full Line of  
Store, Warehouse, Platform,  
Railroad and Express

### TRUCKS.

PULLEY BLOCKS, SHEAVES,  
Faucets, Mallets & Car Pushers.



**HENRY B. NEWHALL,**  
105 Chambers Street,  
NEW YORK AGENT.

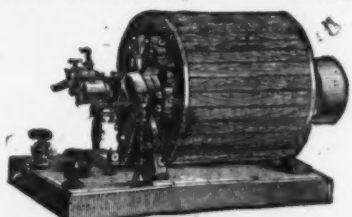
**S. H. & E. Y. MOORE,**  
163 & 165 Lake Street,  
CHICAGO AGENTS.

### The American Dynamo-Electric Machine, For Electro-Plating, Electrotyping, &c.

Requires no Water.

Combining

all the



Latest  
Improvements.  
Cannot Reverse  
Current.

**ZUCKER & LEVETT, Genl. Agents.**  
Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.  
540, 542 & 544 WEST 16TH STREET, N. Y.

### DUPLUX SAFETY BOILER.

Unequalled Economy.

Positive circulation, insuring under all circumstances a clean boiler. No sediment. The best materials. No joints, but expanded joints in combustion chamber.

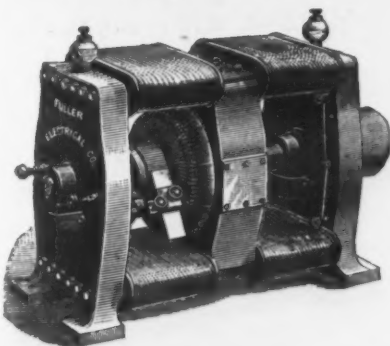
The most durable boiler made. Send for circular.

**DUPLUX SAFETY BOILER CO.,**

34 Cortlandt Street,  
NEW YORK.

Chicago Office,  
45 Franklin Street.

### ELECTRIC LIGHT.



**THE FULLER ELECTRICAL COMPANY,** having perfected their system of Electric Lighting, are prepared to furnish the Improved Gramme Dynamo Electric Machines and Electric Lamps, either for single lights or for from 2 to 20 lights in one circuit.

This apparatus is unequalled for durability, steadiness of light and economy of power, and requires less attention than any other.

For Price List and further particulars apply to

**The Fuller Electrical Co.,**

44 East Fourteenth St.,  
NEW YORK.

**Stanley Rule & Level Co.,**

MANUFACTURERS OF

Improved  
Carpenters'  
Tools.

Manufacturers of Bailey's Patent Adjustable Planes.  
General Agents for the sale of Leonard Bailey & Co.'s "Victor Planes."  
Manufacturers of "Defiance" Patent Adjustable Planes.



FACTORIES,  
New Britain, Conn.

WAREHOUSES,  
29 Chambers St.,  
New York.

### The Iron-Masters' LABORATORY.

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia.  
With Branch at Warrenton, Virginia,  
**J. BLODGET BRITTON.**

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

#### CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00  
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50  
For each additional constituent of usual occurrence..... 1.50  
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.  
For determining the per cent. of Sulphur or Phosphorus in Iron or Steel..... 7.00  
For each additional constituent of usual occurrence..... 6.00  
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone, or each additional constituent..... 10.00  
or the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12.50  
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.  
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.  
Printed instructions for obtaining proper average samples for analysis furnished upon application

### MINERS' CANDLES.

Superior to any other Light for Mining

Purposes. Manufactured by

**JAMES BOYD'S SON,**  
Nos. 10 & 12 Franklin St., New York.

**Grindstones, Emery, &c.**

**Walter R. Wood,**  
**GRINDSTONES.**  
Berea, O., Nova Scotia, & other brands  
283 and 285 Front Street, New York.

### GEO. CHASE,

The largest manufacturers in the world of

**OIL STONE**

Of all description.

107th Street and Harlem River.  
Send for Illustrated Price List. **NEW YORK.**

### OHIO GRINDSTONES.

Superior Ohio Grindstones, manufactured by P. L. Cole, Constitution, Ohio, will be supplied to the Southern trade at lowest possible rates by

**S. B. LOWE, Southern Agent,**  
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**McDERMOTT & BEEBE STONE CO.,**  
Manufacturers of  
**GRINDSTONES,**  
Cleveland, Ohio.

**OHIO GRINDSTONE COMPANY,**  
Manufacturers of

### GRINDSTONES

Of All Kinds.

127 Superior Street,  
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**ATLANTIC STONE CO.,**  
Quarrymen and Stone Merchants.  
**GRINDSTONES**

of genuine Nova Scotia and other grits from our own quarries. Mounted stones and fittings, scythes and oil stones, polishing grits, &c.  
474 & 478 Atlantic Ave., Boston, Mass.

**LOMBARD & CO.,**

Importers and Dealers in all kinds of

**GRINDSTONES,**

Cor. Lewis Wharf & Atlantic Ave., Boston.  
Stones for Machinists, Carpenters, Farmers and Glass Cutters constantly on hand and cut to order.

**EMERY.**  
Large stock on hand, especially suited to Saw and Shovel Manufacturers, at bottom prices.  
Importers and Manufacturers of

**PURE TURKISH EMERY.**  
**IRVINE, TOWNSEND & CO.,**  
123 Chambers St., New York.

Send for quotations and samples.

### INDUSTRIAL ITEMS.

#### VERMONT.

The vein of iron ore recently discovered in the eastern part of St. Albans is being worked with considerable success. Of the ore already taken out a quantity has been sent to the Pittsford Furnace. Having reached a depth where pumps, machinery for raising the ore and other apparatus are necessary, Boston parties are expected to develop the property.

#### MASSACHUSETTS.

The buildings of the American Screw Company in Taunton, which have been idle since 1873, when the machinery was transferred to Providence, have at last changed hands, with all the real estate connected therewith, and will be at once utilized as a tack and button factory. The purchasers are Anthony & Cushman, who will remove their 55 machines from their tack factory at the Weir and add 50 more to them, thus nearly doubling their capacity, which will give employment to about 100 persons. In the second story H. L. Cushman & Co. will place 25 of their new button machines, which will give employment to about 30 persons. The work of fitting the buildings for their new occupants has already begun, and they will be shingled and put in good order at once. The buildings have a large quantity of shafting and piping, a 75-horse-power Corliss engine, and a 30-horse-power turbine water wheel, all of which will be utilized in the new business. This valuable property has been held at \$60,000 for nearly 10 years, and has been assessed for \$55,000. It is understood, however, that the valuation has been reduced about one-half this year, and the sale is based on the assessors' figures. The old tack factory at the Weir is offered for sale, or will be leased, with the engine and shafting. Taunton has long been a center for the manufacture of tacks. Albert Field commenced in 1827 with one machine, and the Taunton Tack Company in 1852, and when they removed from Union street to their present works had 23 tack and nail machines. D. B. Cushman commenced work when a boy with Albert Field, and was superintendent of the factory 21 years, until 1861. E. S. Caswell commenced work with Mr. Field in 1830, and Otis Allen in 1831. These three are veterans in the business. The Albert Field Tack Company has 200 tack and nail-cutting machines, besides a number of wire nail and eyelet machines. The Taunton Tack Company have 80 machines, besides their rivet machines. Anthony & Cushman have 55 machines, L. A. Rounds 28, and Caswell, Converse & Co. 24, making a total of 186 machines in Taunton, which will be increased to 536 when Anthony & Cushman's new factory is in full operation. Dunbar, Hobart & Whidden, of South Abington, is the second establishment in size in this country, if not in the world, they having 217 tack and nail-cutting machines. It was established by Benj. Hobart in 1810. Since the Albert Field Tack Company has been incorporated (now 12 years) it has never failed to pay a dividend.

The Northampton Emery Wheel Company, manufacturers of emery wheels and emery-wheel machinery, intended to exhibit in the manufacturers' and mechanics' exhibitions, but by reason of their great rush of business, the proposition has been abandoned. Orders for machinery, which it will take at least two months to fill, are on hand, although they have increased their facilities each year, which are now double what they were 18 months ago.

The firm of Nichols Bros., of Barnardston, are fast establishing a name in the manufacture of butchers' shear steel knives, of which they make a specialty. They also manufacture table cutlery for the Boston and New York markets, and their business is assuming such proportions as to make it necessary for them to enlarge their capacity, which they intend to do very soon.

Sweetser & Merritt, manufacturers of upright drills and shoe machinery, at Brockton, are very busy in all their different departments. They make a specialty of upright drills and machinists' tools, building up a large trade in these lines, and the demand for their goods is steadily increasing, on account of the care and attention given to the business.

The American Bolt Company, at Lowell, are full of business, mostly on railroad car and track bolts; also machine bolts and nuts and every description of key screws. This concern has been established over 30 years, and is one of the oldest and most reliable of its kind in the country.

The Belcher & Taylor tool factory, at Chicopee, has hard work to keep up with its orders, and for some time the shop has been running part of the night.

Arrangements have been completed by which the Plymouth Foundry will resume work as soon as iron can be brought to that place.

An addition 100 feet long and 84 feet wide will be built on the north end of the foundry at the mowing machine works at Hoosack Falls this summer.

All the jewelry shops at North Attleboro' are now running full time, and orders are coming in rapidly.

#### CONNECTICUT.

The new high-speed engines for Cheney's works in South Manchester have just been put in place. They are 200 horse-power each, and with the present Corliss engine of 400 horse-power are expected to furnish all the power required.

The Colt's Manufacturing Company, at Hartford, are very busy on their double-barrelled sporting guns, having orders from England and the Continent as well as domestic orders. The company sent off last week 25 Gatling guns for the United States army, all 10-barrelled guns, capable of throwing 1000 shots per minute on a range of one mile. The company are just finishing an order from the Rapid Telegraph Company for 200 key perforators.

The Hartford Spring and Axle Company, at Norfolk, are building a large addition to their works.

The Weed Sewing Machine Company, Hartford, have about completed a new sewing machine for family and light manufacturing purposes. Those who have seen it pronounce it superior to anything in the

market. They are building a gang machine for sewing 18 rows of stitches simultaneously. It has a very powerful feed, with high speed, and a long and elastic stitch. They have just completed a large order for needle machines for the McKay Association.

#### DELAWARE.

A number of workshops belonging to Fusey & Jones, iron shipbuilders, Wilmington, were destroyed by fire last Monday, also a new steamer built for South American waters. The loss is roughly estimated at \$75,000.

#### PENNSYLVANIA.

Two hundred refrigerator cars have been ordered by the American Refrigerator Transit Company from the Lebanon Manufacturing Company, and are in course of construction.

Two hundred and ninety-seven and a half tons of pig iron were manufactured at the furnace of the Warwick Iron Company for the week ending Saturday, July 16.

On the 19th inst. William M. Kaufman & Co. bought the Tipton Furnace of the Miners' Trust Company, of Pottsville. The price paid was \$60,000. This furnace is very well located, and the price paid for it is said to be quite low.

The rolling mill of the E. & G. Brooke Iron Company, in Birdsboro, resumed operations on Monday morning last, after having been idle two weeks for repairs. The work of blowing out Hampton blast furnace of this company was commenced on the 20th. The furnace has been working well for some time, but the discontinuance of operations became necessary on account of the supply of charcoal falling short. The company are concluding arrangements for reopening the old Warwick mines at St. Mary's, Chester County, which have been idle for about seven years, and will commence in a short time. The old engine and hoisting machinery, which were unfit for use, have been placed in thorough working order, a new steam pump placed in position and other apparatus of an improved kind added to enable mining operations to be carried on to the best advantage. The ore procured from these mines is magnetic, of more than average yield and works very nicely in the furnace. Wm. Noble, mining engineer of the company, has charge of the repairs as well as the supervision of the work of taking out the ore. The mines of Smith and Buckley at the same place will also be put in operation as soon as possible.

The report that a portion of the New Mill has been leased and is to be put in operation Monday has no foundation on which to stand. The gentleman in charge of the New Mill and the gentleman to whom the 15 building furnaces were reported leased both assure us of the incorrectness of the statement.—*New Castle Courier.*

The Hinge Works, Beaver Falls, have put in the electric light. Rebecca Furnace blew in on the 11th inst.

On the 2d of July the Duncannon Iron Company completed the largest amount of iron and nails that has ever been finished in one year since the works have been in operation—the amount of iron being over 10,000 tons, or about 2000 tons in excess of any previous year and over 100,000 kegs of nails. They never have made more than 85,000 heretofore in one year.

A new factory is being constructed at Stroudsburg for the manufacture of glassware and lamps. The factory will commence operations in the early part of September, and will be run by the Star Glass Company.

It is intended to stop all the old mills at the Phoenix Iron Works, for repairs, at an early day. The breaking of the bearing brass under the fly-wheel shaft of the rail mill engine made a stop there imperative; so that mill shut down and will not start again until next Monday week. The North mill will run a couple of weeks longer to finish some pressing orders, and then it will stop for thorough repairs. The new puddle mill is progressing finely. The stoppage of the puddling department, together with the rail and west mills, puts many idle men on the street.

**PITTSBURGH AND VICINITY.**

Wm. Clark & Co., of the Solar Iron Works, have commenced running double turn, and are full of orders.

Everson, Macrum & Co., will be compelled to defer their usual stock-taking a month, on account of pressure of business.

The Anchor Coke Works, at Dunbar, Pa., owned by the creditors of the late Robert Henderson, and operated under a lease for the past year by Frick & Co., of this city. The new proprietors have been in the line and coal business for some time past. They have assumed possession.

The repairs at the Homestead Glass Works, of Bryce, Higbee & Co., having been completed, they fired up on last Monday, and will keep running hereafter without cessation. Trade is very fair with this house.

The Siemens-Anderson Steel Co. have had their works shut down for ten days for taking an inventory and making repairs. They quit taking stock some time before. Work is now going on as usual. It was found necessary to start sooner than was intended because of the great influx of orders.

The Brownsville Rolling Mill employs 40 men.

The Chartiers Glass Co., Limited, whose works are located at Chartiers station, Pittsburgh and Lake Erie Railroad, started fire on Thursday of last week, and began making glass on Wednesday of this week. Everything started off in a satisfactory manner. The furnace has a fine draft, and they are enabled to melt glass in seven hours, which is as good as the best of the tank furnaces now in use in this country. They have enough orders on hand to keep them moving steadily for two months.

Wm. Miller, Son & Co., of the Duquesne Forge, are forging four cotton press links, which will weigh 5 tons each. They are the first ever forged in Pittsburgh, and are well worth seeing. They go to New Orleans.

The Phoenix Glass Pot Factory, at Brushton station, has been running some time on preliminary operations, and everything will



# SPRING HINGES.—SCOVILL MANUFACTURING CO.

WROUGHT IRON WITH BRASS SPRINGS.

Packed with Screws.



## SINGLE JOINT.

	Per doz. Pairs.
2 1/2 inch, No. 301.....	\$3.60
3 " " No. 303.....	4.40
4 " " No. 305.....	6.75

## DOUBLE JOINT.

	Per doz. Pairs.
2 1/2 inch, No. 311.....	\$7.20
3 " " No. 313.....	8.80
4 " " No. 315.....	13.50

## WROUGHT BRASS.

### SINGLE JOINT.

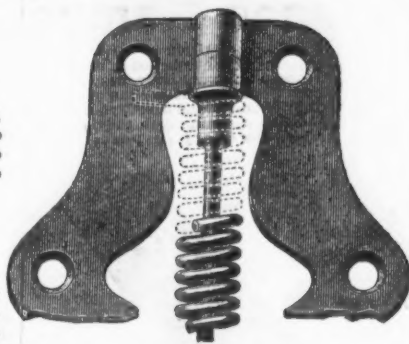
	Per doz. Pairs.
2 1/2 inch, No. 1.....	\$3.00
3 " " No. 3.....	4.50
5 " " No. 5.....	7.50

### DOUBLE JOINT.

	Per doz. Pairs.
2 1/2 inch, No. 7.....	\$6.60
3 " " No. 9.....	8.30
5 " " No. 11.....	16.50

**SCOVILL MANUFACTURING CO.,**  
WATERBURY, CONN.

Depots: 419 & 421 Broome Street, New York.  
177 Devonshire Street, Boston.  
183 Lake Street, Chicago.



The above Spring is removed near the joint to SHOW the SLEEVE.

This is the VITAL POINT in a Spring Hinge, and they are only to be found on Hinges of our manufacture. In all others the Spring will soon break from wear against the pin.

# EXCELSIOR LAWN MOWER



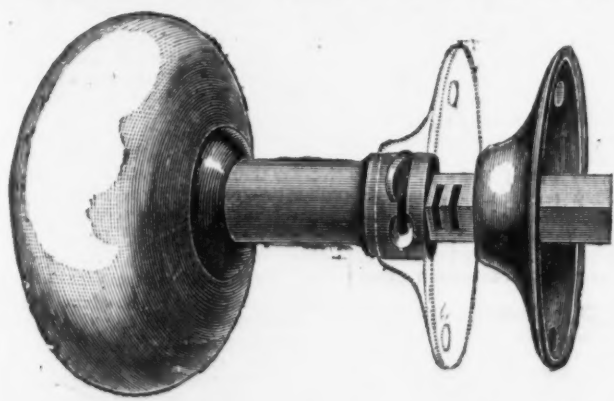
We make Seven Sizes of Roller Mowers and Six Sizes of Side-Wheel Mowers. We claim for our Mowers

Perfect Work, Light Draft and Simplicity.

We have received many first premiums in competitive trials with other Mowers, both in this country and abroad. We have special patterns of Mowers for export, meeting the requirements of every market. Our new Horse Mower is conceded to be the *Lightest* and *Best* Horse Lawn Mower ever made. N. B.—Horse and Hand Lawn Mowers are alike guaranteed in all respects. Send for Illustrated Catalogue. Address

**CHADBORN & COLDWELL MFG. CO.,**  
Newburgh, N. Y.

## IMPROVED FASTENING FOR



# DOOR KNOB SPINDLES.

Patented May 21, 1872.

The above cut represents an important improvement for securing the Door Knob neatly and securely on the spindle without the use of screws. Architects, mechanics and dealers pronounce this device superior to anything of its kind in the market. In fact, no first-class Door Knob is complete without it. No extra cost to dealer or consumer.

Manufactured only by

**THE CLARK MFG. CO.**  
Buffalo, N. Y.

HARVARD PATENT



**BAGNALL & LOUD,**  
BOSTON, MASS.,  
Sole Manufacturers in U. S. A. of our Celebrated

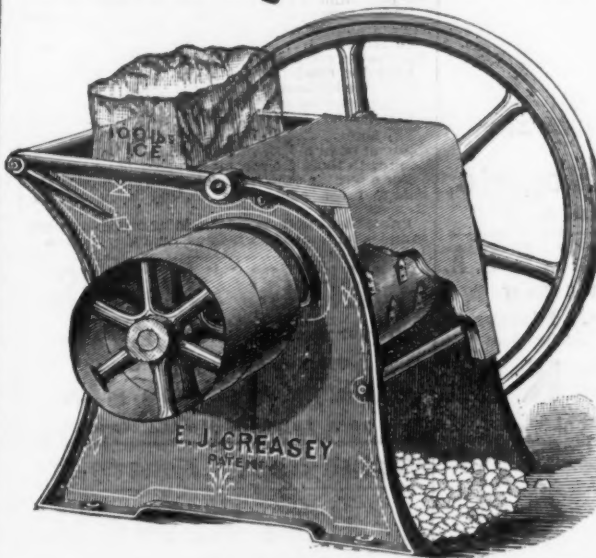
METALINE  
AND

Star Roller Bush  
Tackle Blocks.

Send For Illustrated Catalogue.  
New York Warehouse, 33 South St.



# Creasey's Ice Breaker.



In Use by  
**MEAT & FISH**  
Packers,  
**ICE CREAM**  
Makers,  
**HOTELS**  
AND  
CONFECTIONERS.  
**FIVE SIZES.**

Saves Time, Money  
and Labor.

Send for Circular to

JOS. S. L. WHARTON, 15th and Wood Sts., Phila.

**THE AMERICAN MACHINE CO.,**

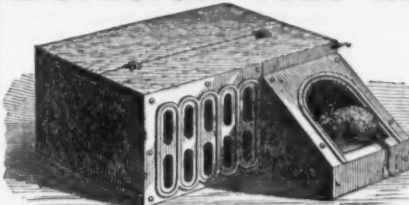
MANUFACTURERS OF

**HARDWARE SPECIALTIES.**

Office and Factory: Lehigh Ave. and American St., Philadelphia. Branch House: No. 128 Chambers St., New York.

**SPECIALTIES:** Fluting Machines, Hand Fluters, Plaiting Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.

## Delusion Rat and Mouse Trap,



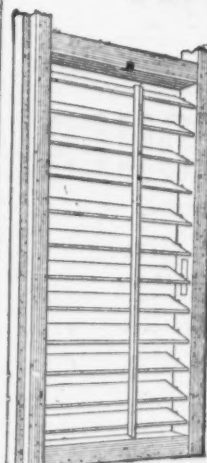
Manufactured by  
**CLAUDIUS JONES & CO.,**  
ERIE, Penna.

This is the only Self-setting Trap on the market, and the most successful. All orders direct to  
**CLAUDIUS JONES & CO.,**  
ERIE, Penna.

# BENTLEY'S Perfect Blind Slat Holder.

Patented.

SUPERIOR TO ALL OTHERS.



For tightening the Slats of Window Blinds and holding them at any required angle.

The sunlight is let in or shut out at will.

The blinds are made a much better protection from cold, because when the slats are shut they are so kept by the Holder and cannot be moved by the action of the wind.

Noisy rattling of the slats is prevented.

The holder is securely held by its spring and the sharp points at each end.

As it is made of brass it will not rust.

It cannot get out of order.

Its superiority over other holders is evident.

It requires no screws or nails to fasten it to the blind. Any one can apply it.

It cannot get loose or deface the blind as others do.

## Retail Prices.

No. 1, For Outside Blinds, 5 cents each; 50 cents per dozen.  
No. 2, For Inside Blinds, two for 5 cents; 25 cents per dozen.  
At which prices samples will be mailed postpaid.

## Trade Prices.

No. 1, \$6.00 per gross; discount 50 per cent.  
No. 2, \$3.00 per gross; discount 50 per cent.

FOR SALE BY THE TRADE.

In case your jobbing house cannot supply you, orders will be promptly filled by

**R. W. BENTLEY, Sole Manufacturer,**

41 FOURTH ST., BROOKLYN, E. D., N. Y.

## PATENTED ARTICLES OF MALLEABLE IRON.

Hammer's Malleable Iron Hand Lamps.



Screw, Kerosene Size.

Hammer's Adjustable Clamps.

Hammer's Malleable Iron Oilers, 3 Sizes.

Hammer's M. I. Hanging Lamps.

**NEW** pattern Heavy Screw Clamps; strongest in the market.

For sale by all the principal Hardware Dealers.

Send for Price List.

**MALLEABLE IRON CASTINGS**

Of superior quality, and Hardware Specialties in Malleable Iron made to order.

**HAMMER & CO.,**  
Branford, Conn.

**J. F. WOLLENSAK'S**

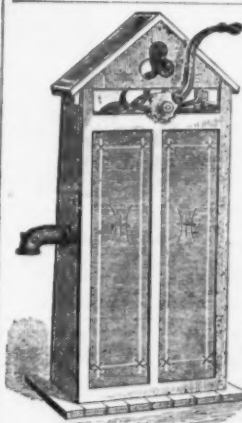
PATENT

Transom  
Lifter  
and Lock.

For all kinds  
of Transoms,  
Fanlights and  
Skylights.

Send for catalogue  
and price list.

**J. F. WOLLENSAK,**  
Patentee and Sole Manufacturer,  
CHICAGO, ILL.



**A. WYCKOFF, Manufacturer,**  
Chain Pump, Tube, &c.,  
ELMIRA, N. Y.



**WM. L. DAVIS, Chelsea, Mass.,**

Manufacturer of

**WINDOW WEIGHTS,**

Sole Manufacturer of

**Park's Patent Folding Lunch Box.**

**CLOTHES WRINGERS.**



**T. J. ALEXANDER, Manager,**  
BOSTON, MASS.

**REVISED  
DISCOUNT SCREW LIST**

**NOW READY.** Revised April, 27, 1881.  
Complete list with 14 discounts. Price, 50 cts.

Published by  
**POPE & STEVENS,**  
114 Chambers Street, NEW YORK.  
Sole Agents for Lamberson's Price Books.



## "Climax" BARREL TANK ATTACHMENTS.



## "Climax"

Is designed to be attached to any Barrel or Cask, thereby converting the same into a temporary Tank, fitted with an effective Pump, and while protecting contents from dirt and waste, the owner has entire control of same, at a GREATLY REDUCED COST. It entirely does away with the labor and waste attendant upon emptying Barrels into any of the numerous Metal Tanks, while securing all the conveniences of the same, at a GREATLY REDUCED COST. The Apparatus can be adjusted in a few moments to a Barrel of any size, and as quickly shifted to another when contents are exhausted, the process of connecting being very simple. It is as compact in form as is consistent with perfect efficiency, and we feel confident that a trial will demonstrate its practical value.

## WHO HAS USE FOR IT?

EVERY ONE  
Who buys in bulk any of the various kinds of Oils, or in fact any Fluid that can be Pumped;

Every Mill, Factory, or Work-Shop, where Oils or other fluids are used, and every store where such fluids are retailed, will find the "CLIMAX" just what they require.

Send for Circular to

**PANCOAST & MAULE,**  
Nos. 243 & 245 SO. THIRD STREET,  
PHILADELPHIA, PA.



## NOTICE TO THE TRADE.

There are six patents, domestic and foreign, on

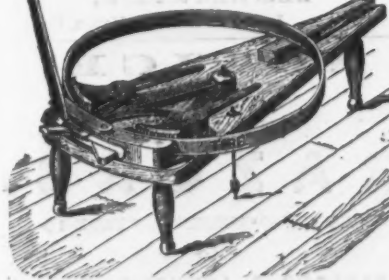
## Rubber Window Cleaners.

We own them all, and shall suppress infringements. The genuine cleaner is plainly stamped, "Manufactured by Perfection Window Cleaner Co., incorporated July 26, 1878." Has patent hollow handle with P. W. C. Co. cast in face. Our manufacturing facilities are so large that we undersell cheap and worthless imitations. We gladly mail sample cleaner with price lists to wholesale trade. Address,

**Perfection Window Cleaner Co.,**  
157 Madison St., Chicago, Ill.

## BLACKSMITHS, HARDWARE

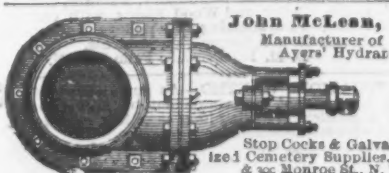
MEN AND AGENTS SHOULD READ THIS.



## LITTLE GIANT WAGON TIRE UPSETTER.

This machine is strong, durable and cheap, and it superior to all others for upsetting or shrinking wagon tires, and bars of iron without cutting them. It will upset tires one inch at a heat, and is adapted to tires of any size or diameter. Every Blacksmith should have one; they are the best selling machines hardware merchants and agents ever handled. Price only \$25.00. Send for circular.

**LITTLE GIANT MFG. CO.,**  
Millport, Cheving Co., N. Y.

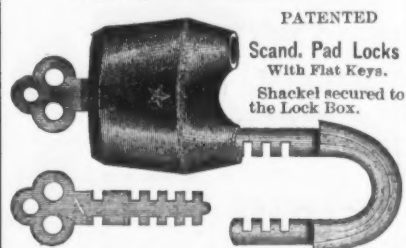


**John McLean,**  
Manufacturer of  
Hydraulic Presses,  
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## STAR LOCK WORKS.

ESTABLISHED 1836.

Trunk Locks, Door Springs,  
Pad Locks, Trunk Stays,  
Dead Latches, Keys, &c., &c.  
110 South 8th St., and Sanson, bet. 8th  
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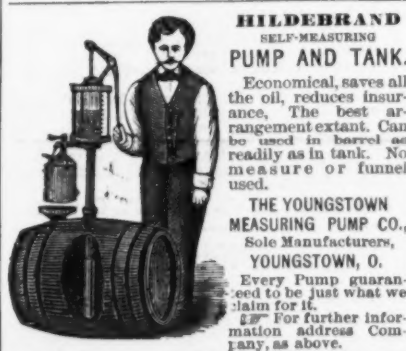
## THE "DAISY" LAWN MOWER.



We are ready to supply the trade with the  
**Cheapest and Best Mower**  
now in the Market.

Every machine unconditionally warranted. It has an adjustable vibrating handle, perfectly adapted for Terraces, Slopes and every variety of Lawn. EVERYBODY CAN AFFORD TO BUY THE "DAISY." Manufactured in four sizes, for hand use. Liberal discount to the trade.

**PAGE, FARGO & CO.,**  
325 Broadway New York.



## Grant Fan Mill & Cradle Co.

Manufacturers of  
Grant's Grain, Coffee, Rice, Cochineal  
and Pimento Fans,



## MUCK BARS

Of Best Quality

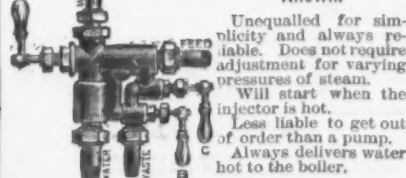
## FOR SALE.

Apply to  
**JUSTICE COX, JR. & CO.,**

333 Walnut Street,  
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## THE DUPLEX INJECTOR.

The Best Boiler Feeder Known.



Unqualified for simplicity and always reliable. Does not require adjustment for varying pressures of steam. Will start when the injector is hot. Less liable to get out of order than a pump. Always delivers water hot to the boiler.

Manufactured and for Sale by  
**JAMES JENKS,**  
16 & 18 Atwater St., East,  
DETROIT, MICH.

## FORGED OX SHOES.

The only Ox Shoe made with patent convexity to fit hoof. Also Flat Shoes with two calks complete, at same price. Worth double any Malleable Iron Shoe.

**Greenfield Tool Co.,**  
Greenfield, Mass.

be in readiness to turn out pots by about Aug. 1. There are plenty of orders on hand and a good trade is anticipated.

OHIO.

The Canton Cutlery Company are turning out 150 kinds of cutlery. The Long & Allstatter Company, Hamilton, manufacturers of power punches, shears, &c., are at work on several heavy machines for the Gautier Steel Company, Johnstown, Pa.

The Bolton Steel Works, of Canton, have received two orders from one firm recently, aggregating \$70,000.—*Cleveland Trade Review.*

The Himrod Furnace, Youngstown, has been blown out.

Whitley, Fassler & Kelley are building the largest shops yet built in Springfield, for the manufacture of reapers, mowers and self-binders.—*Cincinnati Trade List.*

Cordesman, Egan & Co., Cincinnati, manufacturers of wood working machinery, contemplate building another large addition to their workshops.

The agricultural implement manufactory of J. W. Stoddard & Co., Dayton, is doing a large business. New boilers have been put in the Akron Company's Rolling Mill, Akron.

Monitor Furnace is now operated by the Car Wheel Iron Company, and is making an average of from 6 1/2 to 7 tons car wheel iron per day, selling the iron nearly as fast as it is made, which proves how much value it has in the market. Her present blast, which commenced on the 15th of June, to consist of 1500 tons, will likely last till February next.

The Speed Recorder Company, Kent, lately shipped 21 machines, one of which went to Derby, England. The machines are being successfully introduced in Europe. The company have received an order for casting 300 coal car wheels for coal companies at Akron.

Pine Grove Furnace, which blew in on the 28th of May, is doing finely, making from 15 to 18 tons of hot-blast iron per day. Her present blast is expected to amount to 3000 tons.

The following new companies have been incorporated: The Youngstown Glass Roofing Company; capital, \$10,000. The Queen City Forging Company, Cincinnati; capital, \$50,000. The Champion Sewing Machine Company, Hamilton; capital, \$100,000.

The Ohio Iron Company's blast furnace at Zanesville has blown out, after a continuous run of two years and the production of 28,000 tons of pig iron. New stacks, hot-air furnaces and new machinery will be put in, and the furnaces will probably blow in October.

The Webster, Camp & Lane Machine Company, Akron, manufacturers of engines, boilers and mining and milling machinery, have a new brick foundry nearly completed, the dimensions of which are 116 x 72 feet.

KENTUCKY.

The nail and keg department of the Norton Iron Works started up again last week after several days of rest.

Hunnell Furnace cleaned her boilers last week, and is again running her usual 16 to 18 tons per day average. Her bridge house is about to be iron-roofed.

The Lithgow Mfg. Co., Louisville, are making extensive additions to their works, which, when completed, will cover half of an entire square, fronting on Main street. The new building will be three stories and mansard roof, and will be one of the largest manufacturing establishments in the South-west.

TENNESSEE.

The property of the Tennessee Coal and Railroad Company and Sewanee Furnace Company, covering a large body of land, including 15,000 acres of coal, 500 coke ovens, a blast furnace making 100 tons of iron daily, and a standard gauge railroad of 21 miles, with seven miles of branches, the cost of the improvements alone approximating \$2,000,000, has been bought by a party of New York and Nashville capitalists. The price paid is not named.

ALABAMA.

Willard Warner, of Tecumseh Furnace, writes to the *Iron and Steel Bulletin* as follows, under date of July 5: "We entered on our seventh year of blast, on one hearth without blowing out, on the 19th ultimo, and the furnace is making 20 tons per day on 110 bushels of charcoal." This furnace is 60 x 12 feet, and uses brown hematite ore. Its long run is a fact to be remembered.

ILLINOIS.

The Vandever Corn Planter Co., of Adams County, gives notice of an increase of capital stock from \$50,000 to \$100,000.

Shumway, Burgess & Co., of Chicago, have recently taken the contract for 200 tons of bolts to be used in connection with the new cable system of the Chicago City Railway Company.

The Western Fence Co. have recently taken the contract to fence the whole of the Wabash Railroad, 600 miles.

Robert Tarrant, proprietor of the Marine Engine Works, Chicago, having on hand an unusually large amount of work, is running his establishment day and night. He is building 17 barb-wire machines for various firms in different parts of the country.

John Davis & Co., of Chicago, are adding new pipe-cutting machines, lathes and tools to their works.

The artesian well at the Elgin watch factory is now down 1185 feet.

The Chicago Die and Machine Works have just completed a staple machine, to be used in connection with L. L. Ellwood & Co.'s barb-wire works at DeKalb. The machine is a very powerful one, is fitted up in steam-engine shape, and is of the latest improved design. Its capacity is 500 staples a minute. Mr. T. G. Perkins, for many years a practical machinist in Chicago, has consolidated with the Chicago Die and Machine Works. The capacity of these works is now doubled.

The contracts for trimmings which the Union Brass Mfg. Co. have taken during the past week amount, in the aggregate, to 600 cars. They are full of orders till late in the fall, have just placed a new 100-horsepower engine in their works, and are employing on overtime between 400 and 500 men.

Fifteen shares of Rockford watch factory stock were sold the other day at \$175.

The Taylor Horse Power Company lately furnished the Illinois Central Railroad with a number of their machines, to be used in driving elevators.

MISSOURI.

The Midland blast furnace has blown out temporarily, for the purpose of undergoing necessary repairs.

All of the blast furnaces in South St. Louis, except the three at the Vulcan Steel Works, are in full operation; the latter have their fires banked, and will not be blown in again until the coal-hoisting apparatus recently destroyed by fire has been replaced.

The St. Louis Stamping Company's rolling mill has been closed, and will not be started up again until about the middle of September.

The announcement of the burning of the foundry of the Excelsior Manufacturing Co., in St. Louis, was received with genuine regret by the whole stove trade of the country, and by manufacturers in many other lines. The dear old man who stands at the head of this corporation, the venerable and beloved Giles F. Filley, has had more than his share of troubles of late, and he and his business associates have the warmest sympathy of all their friends. The company have issued the following circular.

Office of EXCELSIOR MANUFACTURING CO., Nos. 612, 614, 616 and 618 North Main St., St. Louis, July 13th, 1881.

To Our Friends and Patrons: We have again met with a severe loss by the burning of our foundries. We have saved most of our patterns and machinery, and shall resume work at once.

We shall devote ourselves particularly to the manufacture of our "Charter Oak" stoves and ranges, and confidently expect to be able to fill all orders for them with little or no delay. Our salesroom, office and tinners' stock department, being in another part of the city, were not injured, and we can fill all orders for tin plate, metals, sheet iron, stamped ware, &c., as usual.

Yours respectfully,  
EXCELSIOR MANUFACTURING CO.

## Our Center of Population.

Mr. Henry Gannett, geographer for the tenth census, recently reported to the Superintendent of the Census a highly interesting return on the center of the population of the United States. That center, Mr. Gannett defines technically as "the point at which equilibrium would be reached were the country taken as a plane surface, itself without weight, but capable of sustaining weight, and loaded with its inhabitants, in number and position as they are found at the period under consideration, each individual being assumed to be of the same gravity as every other, and, consequently, to exert pressure on the pivotal point directly proportioned to his distance therefrom;" which is tantamount to saying that the center of population is the center of gravity of the whole population. It appears that in 1790 the center was 23 miles east of Baltimore, or at 39 deg. 16 min. N. latitude and 76 deg. 11 min. W. longitude. Since then the center has steadily moved due west, almost exactly on the 39th parallel of latitude, until in 1880 it stood at latitude 39 deg. 04 min. and longitude 84 deg. 39 min., having shifted during the 90 years 8 deg. 28 min. of longitude. This due westward movement has varied, in distance traveled, between 36 miles and 81 miles per decade, and aggregates for the whole period (90 years) 457 miles. The following statement will show the number of miles that the center has moved westward during each period of 10 years:

Ending	No. of miles.
1790—23 miles east of Baltimore	23
1800—Movement Westward	36
1810—	39
1820—	39
1830—	55
1840—	55
1850—	55
1860—	81
1870—	42
1880—	58
Total	457
Moved Westward in 90 years	457

This westward march of population does not appear to have been materially affected by political commotions. During the peaceful decade ending with 1810, the center moved only 36 miles, the shortest march made during any of the decennial periods; and yet, in the troublous 10 years ending with 1820, the center advanced 50 miles westward. During the 10 years between 1860 and 1870, however, the westward advance was only 42 miles, while in the next preceding decade a march of 81 miles was accomplished. It would be difficult to account for this striking difference upon any other grounds than that the great civil struggle that broke out in 1861 temporarily exhausted the spirit and resources of westward enterprise.

While the utilization of the vast agricultural lands of the West and Southwest and Northwest, and the populating of the Pacific slope have been the main factors in producing this constant shifting of the center of population, yet these causes could never have operated beyond a very limited extent had it not been for the introduction of steam transportation, especially as applied to the railroad. Accordingly, we find a counterpart to this westward advance in the development of our railroad system, as will appear from the following statement of the mileage of road in each of the geographical divisions for the five latest decennial years, compiled from Poor's Manual of Railroads:

States.	1841.	1850.	1860.	1870.	1879.
	Miles.	Miles.	Miles.	Miles.	Miles.
New England...	589	2,508	3,660	4,494	5,993
Middle.....	1,837	3,202	6,706	10,991	15,679
Western.....	195	1,276	11,061	23,769	40,963
Southern.....	613	2,035	9,182	15,463	14,333
Pacific.....	.....	.....	23	1,677	3,019
Total U. S.....	3,535	9,021	30,365	53,309	86,407

A comparison of the increase of mileage in the New England, Middle and Southern divisions with that which has occurred in the Western States illustrates the close connection between the development of the railroad system and the changes in the location

of population. Since 1850, the center of population has shifted 181 miles westward. During that period, the mileage of railroad has increased 3395 miles in New England, 12,477 miles in the Middle States, 12,298 in the Southern States, and no less than 45,687 miles in the Western States. The bearing of this large Western increase of railroad facilities upon the current of population cannot be regarded as having yet been fully realized. The shortening of travel, the opening up of fruitful lands, and the creation of mining, manufacturing and commercial resources, which have been effected by the 47,000 miles of railroad now traversing the region west of the 35th line of longitude and north of the 35th of latitude, cannot fail to exert continuously and increasingly an attraction upon the tide of immigration and upon the population located in the Eastern and Southern sections. There is more than mere poetic sentiment in the motto, "Westward the Star of Empire takes its way." On this continent, the laws of soil and climate and mineral distribution make it a natural necessity that the future preponderance of population, wealth and political power must lie between the Alleghenies and the Rocky Mountains; and they build blindly who base their plans for the future upon any other expectation. There is no little danger attending the assumption that our Eastern trade centers are to control perpetually the commerce of the country. No intelligent traveler through the West can fail to discern at such cities as Chicago, Cleveland, Cincinnati and St. Louis the broad foundations of a manufacturing industry that is ere long to throw into the shade the wealth of will property that has hitherto supplied the merchandise consumed by the West. For its foreign commerce, that section must always remain dependent upon the great Atlantic cities; and the intermediary functions in that commerce performed by New York will carry therewith a vast system of exchanges that must make this city for all time the great financial center of the country. But as respects our rapidly increasing domestic industry, it may as easily as not turn out within a few years that the East is as dependent on the manufactures of the West as the West has hitherto been dependent on the productions of the East.—*New York Commercial Bulletin.*

## The Effect of Low Rail Rates on Canal Shipments.

In order to show the effect of low rail rates on the shipments on the Erie Canal, the *Railroad Gazette* gives the shipments from Buffalo in successive weeks by canal and rail in this and last year:

Week ending.	By canal.	By rail.	Per cent. by rail.
May 27	1,812,000	1,202,500	40.0
June 3	1,579,400	1,372,000	46.4
June 10	1,579,400	1,372,000	46.4
June 17	1,579,400	1,372,000	46.4
June 24	1,579,400	1,372,000	46.4
July 1	1,579,400	1,372,000	46.4
July 8	1,579,400	1,372,000	46.4
July 15	1,579,400	1,372,000	46.4
July 22	1,579,400	1,372,000	46.4
July 29	1,579,400	1,372,000	46.4
Aug. 5	1,579,400	1,372,000	46.4
Aug. 12	1,579,400	1,372,000	46.4
Aug. 19	1,579,400	1,372,000	46.4
Aug. 26	1,579,400	1,372,000	46.4
Sept. 2	1,579,400	1,372,000	46.4
Sept. 9	1,579,400	1,372,000	46.4
Sept. 16	1,579,400	1,372,000	46.4
Sept. 23	1,579,400	1,372,000	46.4
Sept. 30	1,579,400	1,372,000	46.4
Oct. 7	1,579,400	1,372,000	46.4
Oct. 14	1,579,400	1,372,000	46.4
Oct. 21	1,579,400	1,372,000	46.4
Oct. 28	1,579,400	1,372,000	46.4
Nov. 4	1,579,400	1,372,000	46.4
Nov. 11	1,579,400	1,372,000	46.4
Nov. 18	1,579,400	1,372,000	46.4
Nov. 25	1,579,400	1,372,000	46.4
Dec. 2	1,579,400	1,372,000	46.4
Dec. 9	1,579,400	1,372,000	46.4
Dec. 16	1,579,400	1,372,000	46.4
Dec. 23	1,579,400	1,372,000	46.4
Dec. 30	1,579,400	1,372,000	46.4
Total	1,579,400	1,372,000	46.4

The very low rail rate first applied to the shipments of the week ending June 24, and the best illustration of the effect of those rates is made by comparing the average weekly shipments before and after these rates went into force. It will be seen that the canal shipments this year have averaged one-quarter less since the 15-cent rate was made, while the rail shipments have averaged 70 per cent. more. The decline in canal shipments is the more significant, because it was not till the latter period that there was a great amount of grain to move, it not having been marketed by the producers. Further, the loss of the canal is not by any means measured by the gain of the railroads at Buffalo. A great deal more passes at Suspension Bridge, Salamanca and junctions further south, than at Buffalo, some of which at every place has been diverted from the canal by the low rail rates. The average canal shipments since the low rates have been but half as great as in the corresponding weeks of last year, and at rates which averaged less than 4 cents a bushel, against 6 1/2 last year. Roughly speaking, the canal boats received \$165,000 a week for carrying grain last year, and this year less than \$48,000, and their receipts for grain in excess of tolls were \$141,000 last year and \$36,000 this—about one-quarter as much. This is not only unfavorable for the Erie Canal, but also for the opening of the enlarged Welland Canal, from which a good deal has been expected.

A new freight car for the transportation of grain was placed on private exhibition in Milwaukee recently. It consists, says the *Republican and News* of that city, of four hollow cylinders made of iron and steel, 8 1/2 feet long and 6 feet in diameter inside. These cylinder wheels can be loaded from the top or side, and with proper elevator facilities can be loaded or unloaded more easily and quickly than an ordinary car. The cylinders are perforated with minute holes that admit of a circulation of air through the grain, thus drying wet grain or preventing it from heating while in transit. The car has a capacity for fully 100 bushels of grain, while the maximum load of the ordinary car is 400 bushels. Scientists have long been aware that the power required to roll a given load is only one-seventh of that required to move it when supported on axles. This car is an effort to apply this principle to the transportation of grain.



### Apparatus for the Prevention of Smoke.

Mr. E. C. Engert, before the Society of Engineers, gave the following description of a simple apparatus for the prevention of smoke. The first principle underlying the construction of such devices must be not to allow the cold air to come in contact with the gases arising from green coals, and, for this purpose, the furnace is, so to speak, divided into two parts. The fire-door is removed from the boiler, and a box fixed on in front. On each side of this box rails are placed inside, on which a plate or shutter may rest, which can be pushed forward or backward as required. When pushed forward it passes within the boiler and drops over the fire bars some 18 inches, thereby cutting off the draft and preventing the condensation of the gases arising when fresh coals are put on, thus preventing smoke and the cooling of the boiler.

A still more simple apparatus can be made with the same results, if the opening or flue will admit a higher box. The shutters can be cast together in one piece at an angle of about 130 degrees, to hang within the box on two pins or bolts, thus forming a swinging shutter. A rack is attached to the front of the shutter to regulate the movement. The advantages of this apparatus are: The cooling of the boiler is entirely avoided, the gases are consumed so that smoke is prevented, and there is a saving of from 15 to 20 per cent. of heat and coal.

In ordinary open fire grates the same object is attained, viz., the prevention of the cold air from coming into contact with the green coal, by removing the fire-lump and substituting for it a cast-iron box, which stands out at the back and is open in front only, and which is filled with coal. Within this box is a movable iron plate, which can be forced forward, carrying with it the coals from which the gases have been extracted and consumed by the heat in front, or moved backwards when the box wants refilling. To regulate the draft so that the fire burns brightly in front, a plate is fixed under the grate, coming forward at the bottom. Another plate, resting on pins, is placed on the top of the box to prevent the flame entering the register. By this simple apparatus a bright fire is maintained in front of the grate, half of the heat usually escaping into the chimney is saved, there is little or no smoke, and the smallest coal can be used, and is, indeed, preferable. In kitchen ranges, stoves and vertical boilers, a similar box to the foregoing can be fixed, the movable plate being worked by a lever.

This apparatus can easily be applied to locomotives. A box is placed under the foot-plate the whole width of the fire grate, and the coals put in from the top. By this means the gases are almost entirely drawn out of the coal and consumed, the result being that there is very little, if any, smoke. To supply the grate, the coal is pushed forward by a movable plate and lever.

**Quicksilver Trade.**—The two principal features of the quicksilver trade last month were the large receipts and the small exports. The deliveries were 5152 flasks, which, though 1100 flasks less than in May, were the largest of any other month this year. The exports were 2552 flasks. With the exception of February, when the quantity was 2320 flasks, this is the smallest quantity exported in any month this year. The total exports for the six months ending June 30, were as follows:

China and Hongkong.	Flasks.	Value.
Japan.	10,015	\$288,543
Australia.	275	8,335
New Zealand.	100	3,000
Peru.	49	1,474
Central America.	40	1,200
Mexico.	56	1,680
British Columbia.	9,128	269,127
Panama.	11	318
Totals.	23,384	\$510,564
Same time in 1880.	17,787	\$48,905
Same time in 1879.	27,763	\$81,807

The principal sources of demand are China and Mexico. In the first six months of 1879, China took 20,182 flasks, or twice as much as for the past six months, while Mexico took only 5289 flasks, or a little over one-half of the quantity for the past six months.—*San Francisco Bulletin.*

An Ottawa (Ontario) paper, in speaking of the lumber interests at that point, says that slabs nowadays at the various saw mills are almost invariably worked up into fence pickets and lath, and have become a source of wealth to the mill man, paying about as well as the lumber itself. But still there are the edgings, which are cut into 4-foot lengths and sold for firewood, as well as the worst of the blocks. The best of the latter of the blocks are sold to match manufacturers, being disposed of to a "hog" or "hog" of the lumber trade show a "hog" of utilizing every iota of material in a "hog" after the lumber, come pickets and lath from the slabs, matches from the edging blocks, and fire lighters from the sawdust, a portion of the latter being also used for purposes of fuel in feeding the furnaces supplying the power for the match factory and mill and tub factory. If a slab is thick enough to produce another board, it is sent through the English gate and split, the balance being passed to the lath mill, where as much of it as possible is made into lath and fence pickets, the edgings being for firewood. Slabs that will not bear resplitting are thrown into what is called the "hog," a machine that chews them up so effectively that one would scarcely recognize them as having once been a portion of a log. This stuff, with sawdust proper, is largely used in filling up docks and for other purposes. The best of the blocks from deals are sold to match makers, and the rest used for firewood. Match blocks are worth about \$5 per cord, and, as the production is about 150 cords for six months, it brings in quite a nice amount in a season—900 cords at \$5 a cord amounting to \$4500.

The difficult task of removing the great iron tower in Philadelphia, known as Sawyer Observatory, has just been successfully accomplished. It was 160 feet in height, 8 feet in diameter at the base, and weighed 40 tons. By means of a pair of shears, formed of two massive timbers 90 feet long, fitted with a block and tackle, the tower was

swung from the center and lowered to the earth, where it will be separated into sections of 25 feet each for removal to Boston.

The following table, showing the several rates for the carriage of iron ore, pig iron, &c., in the different iron-producing districts, has been compiled on behalf of the British Iron Trade Association:

District.*	MAXIMUM, MINIMUM AND AVERAGE RATES.		
	Maximum per ton per mile.	Minimum per ton per mile.	Average per ton per mile.
Iron Ore.	Pence.	Pence.	Pence.
North Staffordshire.	1.24	0.36	0.91
West Cumberland.	2.40	1.55	1.88
Northamptonshire.	0.65	1.50	0.53
Lancashire.	5.25	1.96	3.03
South Wales.	1.48	1.36	0.98
Scotland.	1.6	0.5	—
Pig Iron.			
Cleveland.	2.15	1.71	1.10
North Staffordshire.	1.83	0.74	1.17
West Cumberland.	2.40	0.54	0.96
Lancashire.	1.67	0.78	1.28
Lancashire.	2.09	0.60	1.10
Northamptonshire.	1.10	0.93	1.00
South Wales.	3.75	0.67	1.22
Lincolnshire.	1.38	0.78	1.02
MANUFACTURED IRON.			
Cleveland.	3.07	0.83	1.44
West Cumberland.	4.80	0.66	1.46
Lancashire.	1.42	1.14	1.57
North Staffordshire.	2.38	0.90	1.64
South Wales.	5.78	0.74	1.57

\*In Cleveland the rates for iron ore vary from three farthings to one penny per ton per mile.

The great strike of the nail makers of Staffordshire, which began last month, when 30,000 operatives went out, has ended, the masters having conceded the 30 per cent. advance in wages demanded.

### Special Notices.

#### AUCTION NOTICE.

**TRADE SALES.**  
**BISSELL & WELLES,**  
Auctioneers,  
83 Chambers and 65 Reade Streets,  
NEW YORK.

**TUESDAY, August 2d,**  
At 10 o'clock a. m.

Large Sale of Hardware, Housefurnishing Goods, Cutlery, &c.,

Comprising a very large assortment of Hardware, Tinned Ware, Pumps, Table Cutlery, Wooden Ware, &c. Also large lot of White Enamelled Ware, 100 doz. Shovels, &c., &c.

**TUESDAY and WEDNESDAY, Aug. 16 & 17,**  
LARGE TRADE SALE OF

Hardware, Edge Tools, Table Cutlery, Housefurnishing Goods, 500 lots Stamped, Tinned and Enamelled Ware, &c., &c.

Particulars in future advertisements. Manufacturers and Importers who desire to contribute to this sale will please forward their invoices as early as possible.

### Nut and Bolt Machinery FOR SALE.

One No. 1 Nut Machine, capacity 1½ inch nuts (Bolt size), hexagon and square, and all smaller.  
One No. 1 Washer Machine, capacity all washers on the list.  
Two No. 2 Washer Machines for ½ in. washers and under.  
One No. 3 Nut Machine for ½ in. nuts and under, hexagon and square.  
One Circular Shear for cutting sheet metal.  
Three Double Head Bolt Cutters, automatic stop for all threads to 1½ in.  
Six Bolt Pointers for 1 in. bolts and under.  
Six Crank Planers, especially intended for rapid die making or short surface planing, particularly adapted for making tools for our machines.  
One each 4 and 6 spindle Nut Tappers.  
These machines are either completed or will be in two weeks, and are the same we have heretofore furnished so successfully to bolt manufacturers, car builders, iron works, rail mill, railways, &c., &c. in this country and Canada. Our last lot of six each No. 2 Nut Machine and No. 2 Bolt Headers are all sold, and it will be about 4 weeks before we shall be able to complete any more.

### YORK & SMITH, CLEVELAND, OHIO.

### The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,  
Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens Martin, Puddling, Blast and Cupola Furnaces. The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 27 of The Iron Age of Oct. 25th, 1877.

### For Sale.

A train of rolls, nearly new, consisting of the following pieces for metallic rolling:  
One pair 16 pinion housings.  
Two pair of 2-high 16-roll housings.  
One pair double face mill pinion, 16 housings.  
One pair 16 x 20 chilled planishing rolls.  
One pair 16 x 18 chilled grooved rolls; takes from 1½ to 2-16 round.  
Spindles and couplings complete, and all necessary gearing for driving 16 train.  
One blast furnace.  
One 14-foot driving wheel, 24 in. face, in halves.  
For price and particulars apply to

THE BIRMINGHAM IRON FOUNDRY,  
Birmingham, Conn.

### NEW MAP OF THE MENOMINEE IRON RANGE.

Scale, ¼ in. to mile. Size, 35 x 55.  
Mounted on rollers, or on cloth in cases.  
Price, \$6.00.

Sent to any part of the United States free of freight.  
SILAS CHAPMAN, Milwaukee, Wis.

WANTED.—Engagement with an iron manufacturing firm, either as salesman, agent, superintendent of works, or general business manager. References given when required.  
Address, E. McMILLIN, Pomeroy, Ohio.

### Sanderson Bros. Steel Co.

A limited number of shares for sale by EDWARD FRITH & SON,  
241 Pearl street, New York

### Special Notices.

#### New and Second-Hand MACHINERY.

One Horizontal Engine, 15½ in. x 30 in. Todd & Rafferty.  
One Horizontal Engine, 3 in. x 6 in.  
One Beam Corliss Engine, 500 H. P.  
Portable Engines from 10 to 25 H. P.  
Two Horizontal Steam Tub. Boilers, 100 h. p. each.  
One Hor. Tubular Boiler, 6 ft. x 14 ft. 67 4-in. tubes.  
Two Hor. Tub. Boilers, 4½ ft. x 13½ ft., 43 4-in. tubes.  
One Locomotive Steel Boiler, 30 h. p.

#### MACHINISTS' TOOLS.

Twelve Lathes, 22 x 12. New.  
Ten Lathes, 18 x 8. New.  
One Cameron Pump, No. 2.  
One Styles & Parker Foot Press.  
One Root Gas Exhauster, No. 15.  
One Lath, 24 in. x 13 ft.  
One Upright Drill, 32 in. Pond.  
One Milling Machine. Pratt & Whitney.  
One Tapping Machine, 6 in. Saunders' Sons.  
One Tapping Machine, 1½ in. Saunders' Sons.  
One Hydraulic Press, 8 inch ram.  
One 30-ton Hydraulic Press and Pump.  
One Knowles Special Pump, No. 7.  
One Bliss & Williams Foot Press.  
One Peck, Stow & Wilcox Foot Press.  
A large stock of Shafting, Pulleys, Hangers and Miscellaneous Machinery.  
One Upright Drill, 36 inch.  
One Burleigh Rock Drill, No. 4. New.  
One Hotchkiss Compressed Air Hammer.  
Fifty Wrought Iron Vices, all sizes.  
One Daniels Planing Machine.  
Three pair Fairbanks' Scales, 2500 lbs. each.  
One Pipe Cutting Machine.  
One Paper Roller.

**J. GRAY'S MACHINERY DEPOT,**  
37 Day Street, New York, U. S. A.

### Household Specialty Wanted.

The advertiser being in position to advertise and sell articles of household convenience very largely, would like exclusive or general agency for one or more articles of general necessity, which can be sold largely and cheaply. Correspondence is invited and full particulars desired.  
C. M. PALMER,  
Minneapolis, Minn.

**Wanted to Purchase,**  
**Second-hand Engines, Boilers and**  
**Wood-working Machinery.**  
**BELCHER & BAGNALL,**  
40 Cortlandt street, N. Y.

### Wanted.

A GOOD SECOND-HAND TRIP HAMMER, suitable for drawing Picks, Mattocks, Grub Hoes, &c.  
Address, with full particulars, B. M. C.,  
Ironton, Ohio.

### Partner Wanted

with means, for manufacturing the patent Grappling Bucket and Scale; also Hoisting Bucket and Scale, used for automatically handling coal, grain, earth, dredgings, &c. I am well used to handle large numbers of workmen. References and particulars exchanged.  
Address, F. IMHOBST,  
61 N. Liberty street, Baltimore, Md.

### Wanted.

Non-Union Men to work at Burgess Steel and Iron Works, Portsmouth, Ohio.  
Six Puddlers.  
One Bar Mill Roller.  
One Guide Mill Roller.  
One Heater.  
One Shingler.

### Wanted.

A traveling salesman for Northern part of Michigan, who is conversant with the hardware trade and has had experience as a salesman. Give reference and what experience.  
Apply at once to MORLEY BROTHERS,  
East Saginaw, Mich.

### Wanted.

A thoroughly competent SUPERINTENDENT for two Anthracite Blast Furnaces. Address, with full references and particulars as to experience, &c., P. O. BOX 2018,  
New York City.

### Wanted.

A first-class SALESMAN, posted in German Cutlery. Must be well acquainted with the Southern jobbing trade. Address A. B. C.,  
Office of The Iron Age, 83 Reade St., New York.

### Wanted.

BIDS FOR WATER WORKS MATERIALS.—The village of Three Rivers, Michigan, is about putting in water works to be run by water power. Bids for each and all the parts that enter into same solicited. For particulars address  
D. M. BATEMAN, Sec'y Water Board,  
Three Rivers, Michigan.

### Wanted.

Two pair of housings to take in a sheet roll for 16 in. journal, all complete; also, one pair pinions to match. All second hand. Two pair sheet rolls, about 22 in. long, 18 in. diameter; necks, 16 in. diameter, 22 in. long, second hand or new. Address, with full particulars, ROLLS,  
Office of The Iron Age, 83 Reade St., N. Y.

WANTED.—A position as Manager or Superintendent at a Rolling Mill, or to build Rolling Mills. I make my own drawings; have built several mills North, and one blast furnace and two rolling mills South; or I would take a position as inspector of rails. The best of references given. Address, Box 115, Chattanooga, Tenn.

WANTED.—By an experienced Hardware Salesman, a position with some Hardware manufacturing firm in New England and lower provinces. Best of references. Trade thoroughly established. Address F. No. 3 West St., Boston.

AN A-1 METALLURGICAL CHEMIST, who has had many years' experience in the management of Blast Furnaces and Iron Foundries, and thoroughly understands the manufacture of Spiegeleisen, is open for an engagement.  
Address B. G.,  
Office of The Iron Age, 83 Reade St., New York.

SITUATION WANTED.—By a first-class blacksmith, as foreman in a locomotive or car shop.  
Address, T. B.,  
2241 Ingersoll St., Philadelphia, Pa.

### Special Notices.

#### NUT AND BOLT MACHINERY For Sale.

Second-hand Lewis, Oliver & Phillips Header. Pratt & Whitney Tire Blank Header.  
Also, over ONE HUNDRED different sizes and patterns of Bolt Cutters, Tappers, Nut Machines, &c.  
The only Specialists in this line in the United States.  
Patentees and owners of the celebrated National Bolt Cutters.

#### NATIONAL MACHINERY CO.,

Cleveland, O.

#### For Sale.

**The Little Schuylkill Rolling Mill,**  
at Milldale, Schuylkill County, Pa., near Port Clinton, on the line of the Philadelphia and Reading Railroad, consisting of a Merchant Bar Mill in complete running order, with a splendid water power sufficient to run the mill two-thirds of the year. Engines, Boilers, Foundry and Machine Shop, with Lathes for turning rolls, and all other appurtenances necessary to commence operation at once. Together with dwellings, stables and large tract of land, to be sold low if applied for soon. For further particulars address or apply to  
J. O. RICHARDSON,  
No. 232 Dock street, Philadelphia.

### TO CAPITALISTS.

A Rolling Mill and Nail Factory, located on the Pennsylvania Railroad, in the iron and coal region of Pennsylvania, will be sold to close out an estate. The works have a capacity of 6000 tons per annum, are now in first-class running order, and have always done a successful business.  
Address, ADMINISTRATOR,  
Office of The Iron Age, 83 Reade St., New York.

### For Sale.

Hardware stock in Western New York. Will sell Hardware without Tin Shop, if desired. Stock clean and in good shape. Will invoice about \$3000. A rare chance, and good reasons for selling.  
Address, S. A. M.,  
Office of The Iron Age, 83 Reade St., New York.

### FOR SALE.—Machinery in Store.

Three 8 in. swing Drill Lathes, 4 ft. bed, hollow spindles.  
Two 12 in. swing Hand Lathes, 4½ ft. bed. Putnam Mach. Co.  
One 8 x 12 Portable Engine and Boiler.  
One 5 x 12 Portable Engine and Boiler.  
Two 3 x 12 Stationary Engines.  
One 5½ x 12 Stationary Engine.  
Three 9 x 12 Stationary Engines, link motion, suitable for hoisting purposes.  
One Cooper Steam Pump, 8 in. steam, 4 in. water, 14 in. stroke.  
Wood-working Machinery, Knowles' Steam Pumps, Fan and Cupola Blowers, Exhaust Fans, Centrifugal Pumps, Harrington's Screw Hoists. Every good and manufacturers' supplies. The celebrated Phoenix Steam Engines, 15 to 50 horse power. Second to none, and 20 per cent. cheaper than any others.  
I. H. PRATT, 15 S. Water St., Cleveland, O.

### STEAM ENGINE FOR SALE.

ONE CORLISS HORIZONTAL STEAM ENGINE, 23½ in. cylinder, 36 in. stroke; shaft, 11 inches; balance wheel, 20 feet diameter; will run at sixty turns; will give 150-horse power easily. This engine is now in use and is for sale, not for any fault, but because its power is insufficient. Will be sold at a bargain if applied for soon. Inquire in person or by mail of the  
WASHBURN & MOEN MFG. CO.,  
Worcester, Mass.

### For Sale.

BLAST FURNACE PLANT, consisting of one 350-horse-power Engine, with Air Compressors and connections; also, three Boilers, built by Balfour Works, Scotland, good as new. Also, a large lot of fire-brick. For further particulars, address  
BOX 2887,  
New York P. O.

### TO INVENTORS AND MANUFACTURERS.

THE SEMI-CENTENNIAL EXHIBITION OF THE AMERICAN INSTITUTE OF THE CITY OF NEW YORK.

Will open September 14, 1881. Heavy machinery will be received as early as August 22; other goods, September 5. Intending exhibitors must make early application to secure proper space and classification. For blanks and information address GENERAL SUPERINTENDENT AMERICAN INSTITUTE, New York City.

### NOTICE.

### TO THE HARDWARE TRADE,

Retail and Wholesale.

Before buying, send to me for quotations. Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware.

**A. W. WHEELER,**  
141 Lake St., Chicago.

### J. SEIDEL, COMMISSION MERCHANT,

Havana, Cuba. Box 663.

Will be happy to accept the representation of first-class houses manufacturing hardware. References on file at the office of the American Exporter, 86 Duane Street, New York.

### HEAVY IRON WORKS WANTED.

An Eastern Manufacturing Company, doing a profitable business in heavy wrought iron structures, the manufacture and sale of which they control for the United States and Canada, wish to establish additional work, located in the West, South, Pacific Coast and Province of Ontario. Must have first-class freight advantages for receiving rolled structural and merchant iron. Address  
W. O. DOUGLAS, Binghamton, N. Y.

### Special Notices.

#### JOB LOT.

**ELEY BROTHERS'**  
**GENUINE BLUE CARTRIDGE CASES,**  
Twelve Gauge.

The best paper shell in the market. For sale cheap. Supply limited.

**ALFRED FIELD & CO.,**  
93 Chambers St., N. Y.

### JUDICIAL SALE

OF THE  
**ARCADIA IRON WORKS PROPERTY.**

As Special Commissioner of the Circuit Court of Botetourt County, Virginia, I will offer for sale at public auction, to the highest bidder, in front of the Exchange Hotel in Buchanan, Virginia, at 12 m., on Wednesday, the 10th day of August, 1881, that VALUABLE MINERAL PROPERTY known as the ARCADIA IRON WORKS, including the SKIDMORE PLANT, formerly the property of Wm. W. Boyd, dec'd, and recently sold by me to Richard N. Pool, who assigned his purchase thereof to L. F. Beckwith, Trustee.  
This property is situated on the lines of the Richmond & Alleghany and Shenandoah Valley Railroads in Botetourt and Bedford counties, beginning near Buchanan and extending about twenty thousand acres, covering about thirty-nine square miles (the foot-hills and Western slope of the Blue Ridge mountain), and embracing about twenty thousand acres in fee simple, and about four thousand acres additional of mineral rights.  
Part of the land is valuable for cultivation. There is on it great bodies of fine timber, suitable for charcoal, mine timbers, ties, tanbark, &c.  
Its deposits of iron ore—both Hematite (Specular), Brown Hematite (Limonite), and Magnetite—are very extensive and valuable. Some 20,000 tons of the Red Hematite ore may now be seen on the dumps at such different mines. There is also on the property Limestone, Slate, Manganese and indications of Zinc.  
The Hot-blast Charcoal Furnace and outbuildings are in a good state of preservation. The water power (Jennings' creek) is ample for large operations. The property may be advantageously divided into three parts.  
The sale will be with a reservation of the right of way, through the property, granted by R. N. Pool to the Shenandoah Valley Railroad Company, subject, however, to confirmation by the Circuit Court of Botetourt County.  
TERMS OF SALE.—Cash in hand \$50,000; as to \$35,000.22 on a credit until October 4th, 1881; as to \$15,000.22 on a credit until April 4th, 1882; and as to the residue on a credit until April 4, 1883; or at such other time on or after April 4, 1883, as R. N. Pool or L. F. Beckwith, assignee and trustee for R. N. Pool, or either of them, may direct. For deferred payments bonds will be required and the title will be retained until full payment.  
Interested purchasers are invited to inspect the property. For full description, analysis of ores, maps, &c., address the undersigned or Walter N. Johnston, Esq., Buchanan, Botetourt County, Va.  
JOHN W. JOHNSON,  
Special Comm'r.

### FOR SALE.

80 h. p. (15½ in. x 36 in.) Horizontal Engine; two 50 h. p. Andrews Engines, double cylinders; 40 h. p. Upright Boiler; 50 h. p. Horizontal Boiler; Double Cylinder Engine, link motion, 6 in. x 8 in.; Turret Lathes with Chaser Bar; 20 in. x 12 ft. Slide Lathes; 18 in. x 18 in. x 4½ ft. Planer; 3 Column Drill Press; Nos. 1 and 4 Root Blowers.  
A. G. BROOKS & WINEBRENER,  
521 N. 3d st., Philadelphia.

### For Sale.

Hardware Stock and Business.  
Located in one of the best towns of Northeastern Pennsylvania. Stock clean and well assorted, suited to the requirements of the trade where located. Business of 30 years' standing. For terms and full particulars apply to  
JAMES S. KUHN, Towanda, Pa.

### For Sale.

Ten Double Acting Power Punching Presses, A1 order. Eight Single Acting Power Punching Presses, A1 order. Most of the double acting presses are the No. 3 Waterbury Press; the single acting, No. 2. One large Bliss & Williams Punching Press. One hundred and twenty-seven Foot Presses in A1 order, most of them square slides. Address, THE GEORGE PLACE MACHINERY AGENCY, 121 Chambers and 103 Reade sts., N. Y.

### For Sale.

Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.  
Address  
HARDWARE,  
Box 366, Salina, Kansas.

### FOR SALE LOW.—ENGINE.

A Vertical High-Pressure Steam Engine, complete. Cylinder, 24 in. by 48 in. Built by A. J. Sweeney & Son. Can be seen in daily use at our mill factory.  
LA BELLE IRON WORKS,  
Wheeling, West Va.

### ENGINE AND BOILER For Sale.

6 x 15 Horizontal Engine in good condition; also, 25-Horse Power Boiler, Heater, Pump and all other fixtures; all nearly new.  
**BEECHER & PECK,**  
Lock Box 122, New Haven, Conn.

### NOTICE!

### SPECIAL SALE OF RAZORS.

SEE ADVERTISEMENT ON PAGE 10

### OF BRADFORD & ANTHONY, Boston.

### Dixon's Lubricants.

Manufactured by the  
DIXON CRUCIBLE COMPANY







Platina	3	634
Percussion caps	7	1,773
Saddlery	14	1,771
Steel	27	2,737
Speller	130,230	3,095
Silverware	7	1,746
Tin boxes	7,308	44,701
Tin, 44oz slabs, 446,990 lbs.		94,046
Wire	1,083	30,593

The following are the imports of leading articles, compared with previous dates:

	For the week of 1881	29 weeks time 1880	Same time 1879
Cutlery, pkgs.	139	3,010	5,210
Hardware, pkgs.	6	638	541
Iron, R. R. bars	18,166	217,987	515,249
Lead, pkgs.	1,308	22,591	39,457
Steel, pkgs.	30,702	285,815	449,467
Tin boxes	7,308	815,519	379,933
Tin slabs, lbs.	446,990	8,068,988	18,614,243

## EXPORTS OF SPECIES.

For the week ended July 23:

Total	\$147,067
Previously reported	6,353,591

Total since January 1, 1881	\$6,500,758
Same time in 1880	4,929,128
Same time in 1879	11,595,608
Same time in 1878	9,208,058
Same time in 1877	21,141,019
Same time in 1876	37,595,098
Same time in 1875	50,912,089
Same time in 1874	33,355,067
Same time in 1873	37,993,381
Same time in 1872	53,701,450

## EXPORTS, EXCLUSIVE OF SPECIES.

For the week ended July 26:

Total	\$6,748,318
Previously reported	\$6,500,758
Since Jan. 1, 1881	\$176,559,929
Since Jan. 1, 1880	\$248,935,733
Since Jan. 1, 1879	\$213,707,852

## IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending July 27, 1881:

Hardware.

Barthell A. E. Ironware.

Baeder, Adamson & Co. Pkgs., 21.

Baker, Pratt & Co. Cases, 5.

Baker, Hermann & Co. Pkgs., 375.

Bloomfield J. O. & Co. Machinery, pkgs., 41.

Curley J. & Co. Cutlery, cks., 3.

Codd H. & Co. Machinery, cks., 10.

Delamater C. H. & Co. Machinery, pkgs., 5.

Degrauw, Aymar & Co. Cases, 5.

Dolge A. Cases, 4.

Downing, Sheldon & Co. Machinery, cks., 13.

Dreftus, Weiler & Co. Cases, 2.

Field Alfred & Co. Cases, 40.

Case, 25.

Chains, cks., 25.

Folsom H. & D. Arms, case, 1.

Case, 31.

Fletcher W. H. & Co. Pkgs., 11.

Friedrichs Hugo, Chains, cks., 5.

Groffey Chas. F. Arms, cks., 7.

Graef Cutlery Co. Cutlery, cks., 6.

Harley & Graham, Arms, cks., 30.

Jex Wm. & Co. Machinery, pks., 91.

Mach'y, bolts, 1.

Tanks, 25.

Boils, keps, 2.

Moss F. W. Files, cks., 6.

Merchants' Die Co. Arms, cks., 6.

McCoy & Saunders, Case, 1.

McKenna & Robbins, Pkgs., 3.

McLannan W. H. Sew. mach., cks., 2.

Moore's Sons J. P. Cases, 2.

Mount Jas. Cases, 5.

Mulholland, Hickox & Co. Machinery, cks., 4.

Rogers Henry, Cases, 8.

Scloe & Co. Iron mills, box, 1.

Scoville Mfg. Co. Case, 1.

Schewering, Daly & Gales, Arms, cks., 27.

Simmons H. W. Co. Arms, cks., 15.

Thompson John, Cases, 2.

Vought Isaac & Co. Machinery castings, pkgs., 11.

Ward Asiline, Cases, 5.

Wiebusch & Hilger Hdw. Co. Cutlery & hardware, pkgs., 28.

Whyte Alex. Case, 1.

Winchester Rep. Arms Co. Case, 3.

Witte J. O. & Bro. Cutlery, cks., 12.

Guns, cks., 17.

Irish harps, cks., 3.

Razors, case, 1.

Order.

Mach'y, pkgs., 17.

Case, 1.

## EXPORTS

Bremen.

Quant. Val.

Nails, kgs., 7 \$25

Napht, gals. 121,014 9,680

Hdw., cks., 26 873

Mach'y, pkgs., 9 2,000

Ag. imp, pkgs., 23 300

Clocks, bxs., 8 207

Pkgs., gals. 351,742 29,259

Tin plates, bxs., 5 59

Rotterdam.

Mf. iron, pkgs., 9 418

Copper, bars, 31 608

Pumps, pkgs., 3 538

Antwerp.

Hill ore, tons, 107 750

Pkgs., gals. 209,807 17,000

Ag. imp, pkgs., 6 666

Mdw., cks., 13 420

Stavanger.

Pkgs., gals. 72,142 6,067

Gefle.

Pkgs., gals. 135,600 10,500

Waborg, Bus.

Pkgs., gals. 102,191 8,168

Dutch West Indies.

Pkgs., gals. 4,398 356

Hdw., cks., 12 101

Nails, keg., 1 4

Sew. ma., cks., 6 48

Mf. iron, pkgs., 6 333

Pumps, pkgs., 3 48

Hamburg.

Hdw., cks., 94 4,350

Valves, bxs., 37 1,300

Mf. iron, pkgs., 4 310

Pkgs., gals. 259 5,804

Ag. imp, pkgs., 4 103

Met. gds., cks., 1 100

Mach'y, cases, 35 3,285

I. R. goods, cks., 0 483

Spring, cks., 2 24

Dutch East Indies.

Pkgs., gals. 387,670 48,810

Christiana.

Pkgs., gals. 129,129 11,182

Stettin.

Pkgs., gals. 299,702 23,088

Copenhagen.

Pkgs., gals. 143,074 11,446

Pumps, pkgs., 1 30

Clocks, bxs., 25 444

Mf. iron, pkgs., 2 132

Pkgs., gals. 218,322 17,464

Hdw., cks., 37 360

Liverpool.

Copper, bbls., 61 13,500

Mf. iron, pkgs., 21 455

Sew. ma., cks., 205 4,922

Hdw., cks., 170 8,933

Clocks, bxs., 381 6,862

Ag. imp, pkgs., 4 740

Ag. imp, pkgs., 30 3,454

Pkgs., gals. 378,750 30,300

Mach'y, cks., 17 2,435

Pumps, cks., 15 998

Copper, bars, 17 344

London.

Hdw., pkgs., 106 3,385

Guns, cks., 107 2,000

Mach'y, cks., 26 2,727

Ag. imp, pkgs., 93 5,112

Clocks, bxs., 135 3,912

Bayonets, cks., 15 3,000

Nails, cks., 4 60

Hull.

Pumps, pkgs., 8 499

Hdw., cks., 68 968

Ag. imp, pkgs., 3 101

Clocks, bxs., 20 400

Newcastle.

Mf. iron, pkgs., 12 375

Ag. imp, pkgs., 1 65

Hdw., cks., 7 210

Dublin.

Napht, gals. 118,500 1,000

Pkgs., gals. 120,100 9,528

Pkgs., gals. 160,734 13,800

America.

Pkgs., gals. 444,800 39,584

Glasgow.

Windmills, pkgs., 26 96

Mach'y, pkgs., 4 630

Ag. imp, pkgs., 3 172

Sew. ma., cks., 4 400

Hdw., cks., 360 6,000

Clocks, bxs., 135 1,920

Iron rolls, cks., 7 1,025

Mf. iron, pkgs., 8 988

Dunkirk.

Pkgs., gals. 74,483 4,988

Napht, gals. 80,820 6,870

Gibraltar.

Clocks, bxs., 10 150

Pkgs., gals. 22,500 2,650

British North American Colonies.

Hdw., cks., 23 597

Iron ore, tons, 35 440

Mf. iron, tons, 75 1,200

Mach'y, pkgs., 40 4,827

Pkgs., gals. 20,000 12,113

Mf. iron, pkgs., 120 855

Batavia.

Pkgs., gals. 67,200 7,050

Taragona.

Pkgs., gals. 128,845 14,354

Passages.

Pkgs., gals. 107,314 15,598

Havre.

Pkgs., gals. 59,487 22,000

Cutlery, cks., 1 1

Sew. ma., cks., 252 3,000

Pumps, pkgs., 1 186

Mf. iron, pkgs., 3 205

I. R. gds., cks., 4 431

Hdw., cks., 2 46

Marsetilles.

Pkgs., gals. 101,373 8,704

Shells, cks., 1 102

Mf. iron, pkgs., 107 1,374

Ag. imp, pkgs., 5 385

Napht, gals. 52,591 4,940

Valencia.

Clocks, bxs., 7 75

French West Indies.

Pkgs., gals. 5,000 608

Canary Islands.

Hdw., cks., 65 2,831

Needles, cks., 1 9

Pkgs., gals. 62,332 6,92

Clocks, bxs., 3 50

I. R. goods, cks., 1 4

Barcelona.

Guns, cks., 1 25

British West Indies.

Pumps, pkgs., 1 80

Sew. ma., cks., 1 22

Pkgs., gals. 17,487 2,919

Yet metal cks., 1 102

Hdw., cks., 37 725

Shells, cks., 1 102

Tin, bbls., 5 3

Tin, slabs, 205

Mf. iron, pkgs., 7 122

Nails, keg., 49 183

I. R. gds., cks., 1 118

British East Indies.

Pkgs., gals. 21,150 25,578

Porto Rico.

Pkgs., gals. 8,000 960

## COAL.



advance in Foreign, which cannot now be laid down here under \$27 @ \$27.50 from the seaboard, as the freight from New York is \$3.60 per ton.

**Muck Bar.**—Is quoted at \$39 @ \$41 for neutral to good Red-short. There has been considerable activity recently, some of the mills, owing to the hot weather, being unable to get out as they required, and they have been buying more or less in consequence.

**Manufactured Iron.**—The activity noted for some weeks past continues, and brokers and buyers generally report that it is almost impossible to place an order for immediate delivery at any price, as the mills are all sold ahead. Some mills have orders sufficient to absorb their entire production for from 60 to 90 days; and this being the case, it is not surprising that prices are strong. Merchant Bars may be quoted at 2.25¢ @ 2.30¢, 60 days, for assorted orders, and 2.35¢ @ 2.50¢ for all bars; Sheet, 4¢ for No. 24; Skelp, 2.50¢ @ 2.60¢; Tank and Plate, 3.40¢ @ 3.50¢; best brands of Boiler Plate, 6¢ @ 6½¢.

**Nails.**—There is an increasing demand, and it is doubtful whether a round lot could be obtained at current price, \$2.75, 60 days, 2 % off for cash.

**Wrought Iron Pipe.**—The demand continues active, mills are oversold and prices have been advanced. Discount on Galvanized Pipe has been reduced to 65 %, and on Black to 67½ %. Boiler Tubes unchanged, but firm, at 45 % off. Oil Well Tubing has been advanced to 21¢ per foot, net, while Casing remains unchanged at 70¢.

**Railway Supplies.**—There have been no sales of Steel Rails reported here for some time. Spikes remain unchanged at 2½¢, 30 days; Splice Bars, 2.45¢ @ 2.60¢; Track Bolts, 3½¢ @ 4¢, the latter with hexagon nuts, and the former with square.

**Steel.**—The mills generally are well supplied with orders, and the outlook is very promising for a good fall trade. Best brands of Refined Cast Tool Steel, 11¢; ditto Crucible Machinery, 7¢; Bessemer and Open-Heart ditto, 5¢ @ 5½¢; ditto Spring, 4¢ @ 4½¢; ditto Plow, 4½¢ @ 4¾¢. Steel Boiler Plate is in brisk demand, and prices have been advanced to 7¢ @ 7½¢. Steel boilers have almost entirely supplanted iron boilers on steamboats, and those mills making Steel Boiler Plate are very full of orders; hence there is no difficulty in establishing the advance.

**Scrap.**—There is an increasing demand and prices are firmer, although without quotable change. No. 1 Wrought is quoted at \$27 @ \$28 per net ton for Blacksmith, and \$29 @ \$30 for selected Railway; Cast Turnings, \$14 @ \$15 per gross ton; Wrought Turnings, \$21 @ \$22, net; Old Car Springs, \$33 @ \$40; ditto Axles, \$34 @ \$36. In regard to Old Car Wheels it is difficult to give reliable quotations. There are buyers at about \$27 @ \$28 per gross ton, but holders are asking \$30. They are not as important an article as they used to be.

**Window Glass.**—There is a very good business for the season, and it is increasing. Prices are firm, but unchanged. Discount on Single Strength, 60 and 20 %; on Double ditto, 70.

**Coke.**—There is a continued steady trade, the demand appears to be sufficient to absorb the production, and prices are steady at \$1.60 per ton, free on cars at ovens for delivery within next 30 days, and \$1.70 @ \$1.75 for small foundry orders. All quiet in the producing district. The striking miners have all resumed work, and another strike is not likely to be attempted soon.

**Coal.**—There was good water in the river for getting out Coal on Sunday, but owing to the difficulty in getting through the lock at the Davis Island dam, and the want of proper lockage facilities in the Monongahela River, but little over 1,000,000 bushels got out, whereas but for the drawbacks referred to, the shipments would have reached from 7,000,000 to 8,000,000 bushels.

## CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, cor. Lake Street, Chicago, July 25, 1881.

**Pig Iron.**—The Pig Iron market has been improving steadily for the past two weeks, and at present is very strong. Consumers are beginning to realize the fact that quotations have reached as low a point as they are likely to, and consequently are purchasing with much more freedom than heretofore, and placing larger orders; in fact, the demand for all classes of iron is much better than at any time since the beginning of the year. Numerous large orders, ranging from 500 to 2000 tons, have been placed during the past week, at prices from 50¢ to \$1 per ton higher than previous quotations; still there has been no positive advance in quotations on smaller lots, excepting imported Scotch, which is now quoted at \$27 to \$28. We quote Lake Superior as follows: Nos. 1 and 2, \$29.50 @ \$31.50; No. 3, \$32; Nos. 4, 5 and 6, \$33; American Scotch, \$25 @ \$27; Silvery Soft, \$23 @ \$25; X Crane, \$27; X X Crane, \$25; Thomas, \$25.50 @ \$26.50.

**Steel Rails.**—Are in very good demand at \$63 @ \$64 for immediate delivery, while the quotation for future delivery would be about \$60. We learn of some very large orders in the market, and heavy purchases have already been made.

**Iron Rails.**—Are in fair demand at \$51 @ \$53, according to specification.

**Manufactured Iron.**—The market for Manufactured Iron is strong, and prices are very firm. Stocks of standard sizes are in most cases very light, while some few have just barely enough to supply their immediate wants. The demand continues to grow for all classes of iron. We quote Bar in store at \$2.50; rates at mill here, \$2.40 @ \$2.50. Plate, Sheet and Tank are quoted firm at \$3.50. Angle at \$3.20 rates; T at \$3.50 rates, and Hoop at \$3.20 @ \$3.30.

**Nails.**—Nails are selling very satisfactorily at \$3 for rod, in less than carload lots, with 10¢ off for the latter and 2¢ for cash; fair stocks on hand.

**Steel.**—The Steel market is inclined to be somewhat dull; still a fair amount of sales are reported. We have no change to note in quotations, which are

as follows: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢; and O. H. Spring, Tiro and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢; and soft Steel Center Plow, 10½¢.

**Scrap Iron.**—Market continues dull and demand slight. We quote: No. 1 Wrought, \$23; Forge Scrap, \$29 @ \$30; Heavy Cast, \$20 @ \$21; Stove Plate, \$13.

## CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, July 25, 1881.

Our report that "the heated trend in its greatest violence had subsided," in last week's *Iron Age*, was an error. The mercury has marked 90 degrees at the signal office on each of the last days of the week. Breezes and thunder showers at the close have modified our distress somewhat. Business has shown rather more activity than usual for the season. The disposition of holders to concede shadings in order to sell has been less marked. A good many leading articles appear to have stiffened up decidedly, and there is a sudden and unexpected scarcity in some lines, indicating the effect of stoppages of furnaces and mills and the renewal of contracts.

**Pig Iron.**—There is again a decided scarcity of some grades of Foundry, and dealers find difficulty in supplying their customers promptly. Stocks of other grades are down to a healthy standard, and at the present rate of consumption not likely to accumulate. We quote: No. 1 Foundry, \$22 @ \$23; No. 2 Foundry, \$20 @ \$21; Gray Forge, \$18 @ \$19; White and Mottled, \$16 @ \$18; Car-wheel Metal, \$38 @ \$40.

**Ores.**—We quote: 50 % Brown Hematite, per ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25.

**Miscellaneous Articles.**—Old Rails are in rather better request, but there is no change in price. The demand is still mostly for shipment. Prices may be regarded as a little stronger. Scraps show no special life in any of the grades. We quote them at \$26 @ \$28. Wrought Scrap, \$20 @ \$25; Cast Scrap, \$10 @ \$15; Old Wheels, \$28 @ \$30.

**Nails.**—Are dull at the nominal rate of \$3.10, with liberal discounts to large purchasers and for cash.

**Manufactured Iron.**—Bar is decidedly stronger than for some months at \$2.25 rates, with good prospects of an advance. The mills are full of orders and bills for September are coming in in considerable amounts. We continue to quote: Spikes, \$3.15; Track Bolts, \$4; Trestle Bolts, \$4.50; Fish Plate, \$2.50.

**Coal.**—Household supplies \$4 per net ton delivered. New contracts for manufacturing purposes, run of mine, could not be made below \$3.

**Coke.**—We quote: Furnace Coke, \$3 per ton at furnace; Foundry, 10¢ @ 12¢ per bushel.

**Steel and Iron Rails.**—Steel Bars, \$62 @ \$64 at mill; Iron, \$50 @ \$52; Small, \$57 @ \$60.

## BOSTON.

JULY 23.—The indications of an upward tendency in the market which were noted last week continue and are more decided, and in some cases higher prices have been realized. Agents report a great demand for stoves in the Western market, in consequence of the great emigration to that section of the country. Buyers who have been holding off are coming into the market, but are unable to make contracts at rates which were current last week. Foreign Iron has touched within 2/ or 3/ of the lowest rates known for ten years. Freight have advanced and it is difficult to get sailing vessels for freight iron. We continue to quote American Pig Iron at \$23.50 @ \$24 for No. 1 X; \$21 @ \$22 for No. 2 X, and \$19 @ \$20 for Gray Forge. These prices are f. o. b. at the port of shipment. Small spot lots will command \$2 1/2 ton higher. Foreign Pig is in good demand and the market continues strong. We quote Coltness and Langloan at \$24; Glengarnock and Gartsherrie at \$22 @ \$23; Carnbroe at \$21.50 @ \$22; Eglinton at \$20.50 @ \$21, and Middlesboro' at \$19 for No. 1, and \$17.50 for No. 3. Old Rails are held a trifle higher than they were, and though the demand is moderate, holders appear indifferent about selling at anything less than \$23 @ \$28.50 for American, and \$25.50 @ \$27.50 for Foreign. Manufactured Iron.—There is a decided upward turn in some classes of Finished Iron, with much activity. Bar Iron is in good demand, and there is none offering in this market at better than \$22.20. Horse Shoes are quiet and steady at 4½¢ @ 5¢ lb. Swedish or Norway Iron is unchanged at \$3.75 for Bars and \$4.75 for Shapes. Plate Iron is firm and very active, with advance upon last week's prices. Tank is selling at \$3.10; Refined, \$3.25; Shell, \$3.75; Flange, \$4.75; Tubes are in demand at 45 % discount from list. The mills decline orders at present rates for prompt delivery. Nails are selling at \$3 @ \$3.10, though the nominal quotation is considerably above these figures. The Boston store prices of Steel are as follows: Best English Cast, 14¢ @ 15½¢; American ditto, 12¢ @ 12½¢; Bessemer Machinery, 5¢ @ 6¢; Crucible ditto, 7¢ @ 7½¢; Wedge and German, 7¢; English Spring and Calking, 7¢ @ 7½¢; American Spring and Calking, 5¢ @ 5½¢; Tire, 3½¢ @ 3¾¢; Sleigh Shoe, 3¢ @ 3½¢. In this market there is but little changing hands and the market continues apathetic. Copper is weak and dull. It is the opinion of many operators that, on account of the opening of new sources of supply, the price of Copper will decline until the level of foreign markets is reached. We quote Ingot at 16½¢ @ 16¾¢; Sheathing, 26¢; Braziers, 28¢; Bolt, 25¢; Copper Bottoms, 29¢; Yellow Metal, 17¢; Yellow Metal Bolts, 20¢. Lead.—Some advance in Lead is noted, attributed to the strikes among smelters. We quote Pig at \$4.80;

Bar, 7¢; Pipe, 7¢; Sheet, 7½¢; Tin-lined Pipe, 15¢; Tin Pipe, 35¢. Spelter shows little change. We quote \$5.15 @ \$5.25. Small lots bring \$5.40 @ \$5.50. Sheet Zinc is in fair demand at 6½¢ @ 7¢. Tin in unchanged. We quote 20½¢ @ 20¾¢ for Straits and English. Tin Plates are in moderate demand at steady prices. We quote: Charcoal Bright, \$6 @ \$6.25; ditto Ternes, \$5.37½ @ \$5.50; Coke Tin, \$5 @ \$5.25; ditto Ternes, \$4.87½ @ \$5.12½.—*Commercial Bulletin.*

## LOUISVILLE.

Messrs. GEO. H. HULL & CO., Commission Merchants, report to us as follows, under date of July 22: The market has been very quiet during the past week. Prices on standard brands nominally unchanged. Consumers generally are supplied for some time to come, and are holding out of the market. We quote, for cash:

## FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal.....\$27.00 @ 29.00  
No. 2 Southern, Charcoal.....25.00 @ 27.00  
No. 3 Hanging Rock, Stonecoal and Coke.....23.00 @ 25.00  
No. 4 Hanging Rock, Stonecoal and Coke.....21.50 @ 23.00  
No. 5 Southern, Stonecoal and Coke.....20.00 @ 22.00  
No. 6 American Scotch.....18.00 @ 20.00  
No. 7 Silver Gray.....16.00 @ 18.00  
No. 8 Scotch.....14.00 @ 16.00

## MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral.....21.00 @ 22.00  
No. 2 Stonecoal and Coke, Cold-short and Neutral.....19.50 @ 21.00  
No. 3 Stonecoal and Coke, Cold-short and Neutral.....18.50 @ 19.50  
No. 4 Missouri and Indiana Red-short.....25.00 @ 27.00  
No. 5 White and Mottled, Cold-short and Neutral.....17.00 @ 19.00

## CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast.....35.00 @ 41.00  
Alabama and Georgia, Cold-blast.....35.00 @ 41.00  
Kentucky, Cold-blast.....35.00 @ 41.00  
Hanging Rock, W. B.....30.00 @ 35.00

## ST. LOUIS.

Messrs. HOFFER, PLUMB & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, write us, under date of July 23: A number of transactions for future delivery have been concluded lately, at prices corresponding with our quotations. It is hoped, though by no means certain that such will be the case, that the strength and firmness which characterizes the Manufactured Iron market will speedily attach itself to that of the Pig Metal, and render necessary a complete change in the figures which we give below as those of to-day's market:

## HOT BLAST CHARCOAL.

Missouri.....\$26.00 @ 27.00  
Southern.....25.00 @ 26.00  
Ohio.....28.00 @ 29.00

## COKE AND COAL.

Missouri.....26.00 @ 27.00  
Southern.....23.00 @ 24.00  
Ohio.....23.50 @ 24.50

## MILL IRONS.

Cold-short.....41.00 @ 42.00  
Red-short.....24.00 @ 25.00

## CAR WHEEL AND MALLEABLE IRONS.

Missouri.....28.00 @ 30.00  
Southern.....25.00 @ 26.00  
Ohio.....31.00 @ 32.00

## CINCINNATI.

JULY 25.—Pig Iron.—There has been more activity in the market during the past week. It is reported by sellers that large sales of mill grades have been made during that time, to go to Pittsburgh and other points on the Ohio River above Hanging Rock, of Virginia, West Virginia, Alabama and Georgia Irons, aggregating 8000 tons, and at prices not below \$21.50, cash, at points of destination. While prices are not weak, by any means, these reports need confirmation. The rolling mills here are practically idle, and will remain so until there is a solution that will cover the views of the mill owners and the workmen. It is said by the best authority here that the mills will not start on "union labor," unless upon a basis of Pittsburgh prices. Lately (last week) it has been developed that at least one of the large rolling-mill companies has been buying Irons in Cleveland, Chicago, Pittsburgh and other mills outside of this region, taking and filling orders right along, and getting better profits than if produced in their own mills, if made on a basis of 5 per cent. above Pittsburgh prices. The mills of this region, it seems, are not suffering from the strike; it is only the domestic condition of the families that depend upon well-paid labor that is really suffering. Sales of Pig Iron justify the following quotations: Hanging Rock Charcoal, \$26 @ \$27.50; Coke, \$23 @ \$24; Stonecoal Foundry, \$21 @ \$23; S. G. Stettens, \$20.50 @ \$22; Forge, \$20 @ \$21.50; Bar Iron, 2.15 @ 2.25 card rate; Scrap, 40¢ @ 75¢ for Cast; Wrought, \$1.10 @ \$1.30; Scrap Wheels, \$30 @ \$31; Old Rails, \$28 @ \$29.

## BALTIMORE.

W. N. WYETH, Iron and Steel Merchants, 46 and 48 South Charles street, reports us the following, under date of July 25: Trade for the past week has been more active, and prices generally have advanced one-tenth of a cent per lb. The mills are full of orders and very backward in filling them. We quote list as about prices now ruling:

Ref. Bar Iron, 1 to 6 x 3/4 to 1.....\$24 1/2 @ 25 1/2  
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## DRILL BRACE.



This is a 10-inch sweep Brace, with a gear-wheel speeded about three to one, to be used for drilling and also for boring in places where there is not room to revolve the Brace Sweep. By an ingenious device the large gear wheel can be put on at three different angles with the Brace Sweep, adapting it for use in narrow or cramped places. When not needed the gear wheel can be removed in one second, leaving a plain Brace. This Brace is made of steel, and is heavily nickel-plated, with rosewood handle and lignumvitae head. The jaws are of forged steel and will center and hold firmly Round Twist Drills from 1/4 to 7-16 of an inch in diameter. Also, Square Shank Bits and Drills of all sizes. Also, Square and Flat Screw Driver Bits. In fact, it will hold perfectly tool shanks of any size or shape. There is no other chuck in existence which will do this. It is our purpose to furnish everything in the line of Bit Braces and Hand Drills of a style and quality superior to anything else in the market.

Price of Drill Braces per dozen, \$36.

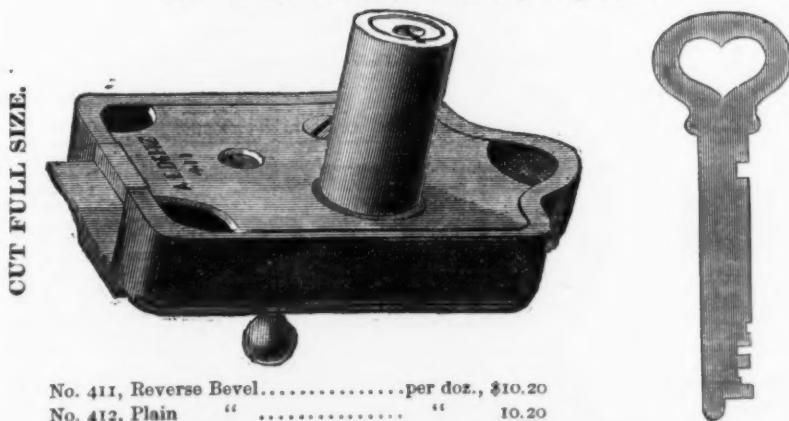
Same discount as Breast Drills.

## MILLERS FALLS COMPANY,

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No. 411, Reverse Bevel.....per doz., \$10.20

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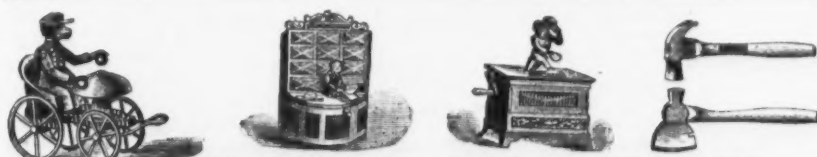
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NEW BEDFORD, MASS., Sole Manufacturers of

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DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS. DRILL GRINDING MACHINES. TAPER REAMERS, MILLING CUTTERS AND SPECIAL TOOLS TO ORDER.

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FIRE AND BURGLAR PROOF. ALSO IMPROVED

ROLLING WOOD SHUTTERS,

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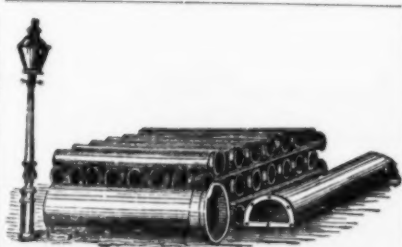
With Binding to Match.

Protect them from wearing and are ornamental. These goods need only be seen by the public; the real merits are at once appreciated. Sample orders solicited and circulars sent on application.

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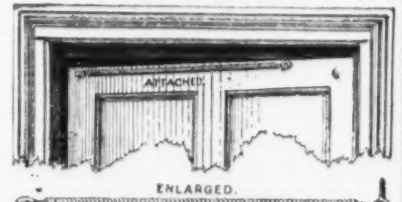
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## The 1881 Pennsylvania Lawn Mower.

OUTSTRIPS ALL COMPETITORS.

PREMIUMS TAKEN OVER ALL OTHER MOWERS.

EVERY MACHINE WARRANTED TO WORK AS REPRESENTED.



BY BUYING THE

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YOU WILL

Save \$2 to \$3 each year in expense of Sharpening and

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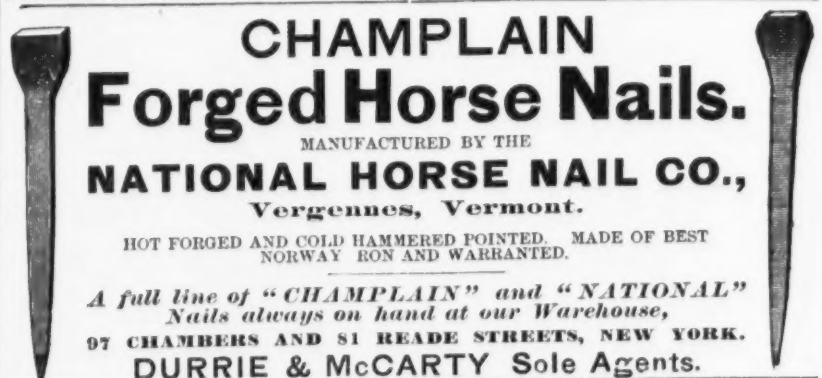
Can Cut Grass Immediately After Rain.

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Also Manufacture the

BEST 10-INCH FORWARD CUT LAWN MOWER in the MARKET, named "QUAKER CITY."

For descriptive catalogue and prices write  
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HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

A full line of "CHAMPLAIN" and "NATIONAL"

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NEW LINE.

WITH SHELL EJECTOR

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Pocket, Police, Navy and Army Sizes.

Also, Double and Single Shot Guns.

Rifles, Cartridges, Shells, Bullets,

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## MEDINA MANUFACTURING CO.

SAMSON & SWETT, Proprietors,

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Manufacturers of

The U. S. Wood Track, Champion, Anti-Friction and Check Back

## BARN DOOR HANGINGS,

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Send for price lists. Can manufacture and introduce to the trade, on contract, royalty or otherwise, articles principally or wholly of gray iron castings. Correspondence solicited.



## The Suez Canal.

The shareholders of the Suez Canal Company held their annual meeting on June 9th, at Paris, when the annual report was submitted and approved. A dividend of 21.89 francs was declared, apart from the fixed interest of 25 francs. The report states that the gross receipts have amounted to 41,820,000 francs, and the gross expenditure to 28,841,000 francs, leaving a net profit of 12,979,000 francs. The most interesting part of M. de Lesseps' report relates to the traffic. During last year 2026 ships, with a tonnage of 4,344,519 tons, passed through the canal. From 1870 till then the figures had been as follows:

Years.	Ships.	Tons.
1870.....	485	405,911
1871.....	758	761,467
1872.....	1,082	1,439,169
1873.....	1,173	2,085,072
1874.....	1,264	2,423,672
1875.....	1,494	2,940,768
1876.....	1,457	2,772,107
1877.....	1,663	3,418,049
1878.....	1,593	3,297,535
1879.....	1,477	3,236,942

The receipts during this period rose from 5,159,000 francs in 1870 to 28,886,000 francs in 1875, and 39,840,000 francs in 1879. Last year 221 ships, with a total tonnage of 353,985 tons, passed through the canal for the first time. Compared with the previous year, this is an increase of 66 ships and 118,371 tons. The Ducal Line, Bird Line, Union Line, Rotterdam Lloyd and Rubattino Company have each added one vessel to their fleet; the China and Japan Line, the Russian Line and the Austro-Hungarian Lloyd, each 2 vessels; the Anchor Line, Ocean Steamship Company and the Peninsular and Oriental Company, each 3 vessels; the Orient Line and the Ligne Francaise, connecting Marseilles with the eastern coast of Africa, each 4 vessels; and the British India Steam Navigation Company, 5 vessels. A new postal line connecting England and Spain with the Philippine Islands has been started with 5 ships. A great trade movement has sprung up between Russia and the colonies of the Amoor and island of Saghalien. There are now some 20 vessels carrying on this new traffic independently of the "national fleet," which has also augmented the number of its ships. Two hundred and thirty-eight steamers last year carried coal from England to different parts of the far East; 57 carried rails and railway material to Kurrachee, and 2 vessels from New York laden with petroleum passed through the canal. There were also 35 vessels from Australia, 2 of which were entirely laden with fresh meat preserved in ice, 27 with Chinese and Japanese products bound for New York, and 26 vessels which passed through in ballast to receive cargoes awaiting them at Indian ports. The report anticipates from the experience of the present year that it will show a still larger traffic than last year, though last year's return already showed, as above seen, an increase of nearly 40 per cent. on those of 1879. Since January last the British India Company have created a new regular service between England and Queensland, and all the great regular lines have sent vessels to the traffic.

Of the 514 axles which failed on British railways during the year 1880, 278 were engine axles, viz., 251 crank or driving and 27 leading or trailing; 25 were tender axles, 1 was a carriage axle, 192 were wagon axles, and 18 were axles of salt vans. Ninety wagons, including the salt vans, belonged to owners other than the railway companies. Of the 251 crank or driving axles, 190 were made of iron and 61 of steel. The average mileage of 182 iron axles was 171,832 miles, and of 60 steel axles, 174,039 miles. Of the 436 rails which broke, 336 were double-headed, 85 were single-headed, 13 were of the bridge pattern, and 12 were of the Vig-noles section; of the double-headed rails, 196 had been turned; 216 rails were made of iron and 230 of steel.

The Steel Company of Scotland has tried the Pernot system and abandoned it. They appear to have come to the conclusion that, owing to the great trouble and expense in keeping the furnaces in repair, the system possessed no special advantage over the ordinary Siemens furnace. They were, however, using these furnaces for soft coal for ship plates, whereas, in other localities, rail steel was being manufactured. This is an important difference, the temperature in the former case requiring to be much higher than in the latter, the carbon being less, and the metal, therefore, more infusible; consequently, the wear and tear and attendant expenses would be proportionately greater.

A circular has been prepared by the Mint Bureau for the purpose of ascertaining the amount of gold and silver used in manufactures and the arts in the United States during the last fiscal year. It will be forwarded by mail to manufacturers, with a request that they fill up a blank form which will be inclosed, calling for the amount of United States coins melted and worked up; fine bars used, and foreign coin, dust and old manufactured articles made into new work. Nearly three thousand answers were received from persons addressed with a similar object in view last year, which showed that there had been an aggregate of \$12,098,363 in gold and silver used in the manner indicated during the fiscal year 1880.

It is gratifying to know that no permanent disturbance of relations between this country and the United States of Colombia is likely to occur, a commission having been appointed by the government at Bogota to settle all diplomatic differences now existing.

## THOMAS MORTON,

Manufacturer of  
CABLE, COPPER, IRON AND STEEL SASH CHAINS,  
for suspending window shades. Also, Copper Cham-  
pion Chains, with patent attachments, for same pur-  
pose. Agents wanted in the principal cities in the  
United States. Apply at  
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STEEL STAMPS STENCIL BRANDS  
BRASS STAMPS STAMPING INK &c  
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UNITED STATES SMELTING WORKS,  
MANUFACTURERS OF

## BABBITT AND TYPE METALS,

Brass Castings and Solders of all Kinds.

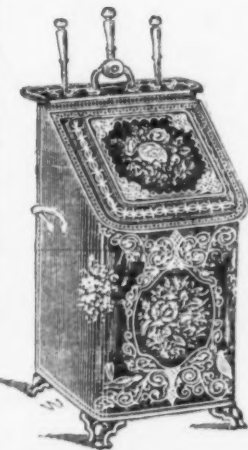
PIG AND BAR TIN. PIG AND BAR LEAD.

Pig Brass and Copper, Spelter, Antimony, &amp;c.

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PATENT PALACE  
COAL VASESThese are the most popular Coal Vases  
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Address

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BUFFALO STAMPING WORKS,

BUFFALO, N. Y., and CHICAGO, ILL.

THE TURNER & SEYMOUR MFG. CO.,  
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Manufacturers of

The "AMERICAN" and CLIPPER SHEARS, Celebrated FAMILY  
EGG BEATER, JUDD'S and other SHADE FIXTURES, PIC-  
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We desire to call special attention to our line of  
Nickel Plated Nut Picks, Nut  
Crackers and Fruit Knives.They are fine in appearance, durable and very  
cheap. They are put up in sets in handsome imi-  
tation Morocco boxes, or any of the articles alone  
in common boxes.

We also have a fine line of

Nickel Plated Scissors,

and many other goods suitable for Holiday trade.  
Price Lists and discounts furnished the trade on  
application.MERIAM & MORGAN PARAFFINE CO.,  
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THE BEST GREASE NEW YORK, 143 Front St.,

For all kinds of

BOSTON, 32 Oliver St.,

Wagons, Threshers, Cog Gearing,

CHICAGO, FERRIS &amp; AVERY,

Heavy Bearings, &amp;c.

Agents, 48 No. Wells St.

## REMOVAL.

Please notice that we have removed from No. 295 THIRD AVENUE to  
No. 37 Warren Street, near Church St.,  
Where we hope to be favored with a continuance of your generous patronage.

## J. M. FARRINGTON &amp; CO.,

Successors to DAY, FARRINGTON &amp; CO., Manufacturers of

LOCKS. KNOBS. GONGS, BLANK KEYS,  
Wrought Store Door and Flush Bolts, Silver Plated, Ornamental Bronze and other Hardware.

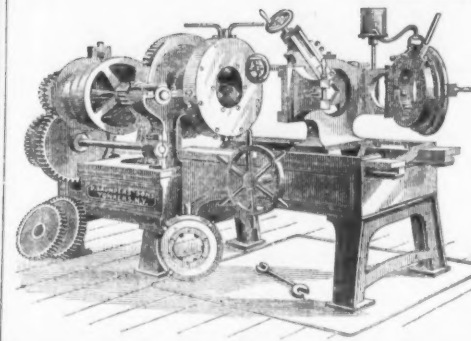
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CLOTHES WRINGERS.

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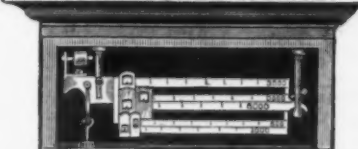
With Every Improvement

which the skill and experience of a half century  
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Manufacturers of WEEKS' PATENT  
COMBINATION BEAM SCALES.

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Price of 3-ton scale, platform 7 x 14 feet, \$53.00

Other sizes proportionately low in price.

EVERY SCALE WARRANTED ACCURATE AND DURABLE.

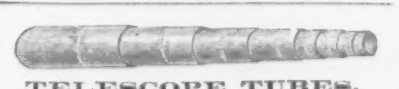
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TINIUS OLSEN & CO.,  
STANDARD SCALES  
AND  
TESTING MACHINES.Manufacturers of Olsen's Little Giant Testing  
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nace Charing Scales.Office and Works, N. W. cor. 19th and  
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Manufacturers of

H. R. Track Scales, Hay Scales, Coal  
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Scales, Counter Scales, &c.

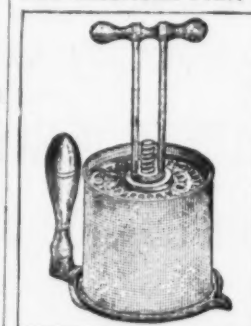
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Fine Mandrel-drawn Tubes, from Brass or Ger-  
man Silver. Tubes for sliding one within the other  
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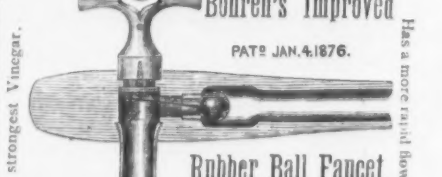
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Iron and Brass Founder,  
TRENTON, N. J.Chilled Cast Wire Dies a Specialty.  
Any size or style made at short notice.

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The best Wood and Metal Faucet yet made.  
Never leaks, splits or shrinks. Is as durable as  
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Makes a Full Line of  
HAND AIR PUMPS,  
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Antonio Brass and Copper Co., 10 Cliff, N. Y. 19

## Belted, Manufacturers of.

Bridgeport Brass Co., Bridgeport, Conn. 19

## Belted, Manufacturers of.

Brown & Bros., 41 Chambers, N. Y. 19

## Belted, Manufacturers of.

Carroll John & Sons, 100 N. 3d, Philadelphia, Pa. 19

## Belted, Manufacturers of.

Holmes, Booth & Haydens, 49 Chambers, N. Y. 19

## Belted, Manufacturers of.

Manhattan Brass Co., 1st Ave., N. Y. 19

## Belted, Manufacturers of.

Merchant & Co., 100 N. 3d, Philadelphia, Pa. 19

## Belted, Manufacturers of.

Plume & Atwood Mfg. Co., 18 Murray, N. Y. 19

## Belted, Manufacturers of.

Rome Iron Works, Rome, N. Y. 19

## Belted, Manufacturers of.

Scott Mfg. Co., 41 Broome, N. Y. 19

## Belted, Manufacturers of.

Waterbury Brass Co., 206 Broadway, N. Y. 19

## Belted, Manufacturers of.

Brass Founders. 19

## Belted, Manufacturers of.

McFarland & Trenton, N. J. 19

## Belted, Manufacturers of.

Rogers Paul S., Philadelphia, Pa. 19

## Belted, Manufacturers of.

Brass Wire Cloth. 19

## Belted, Manufacturers of.

Howard & Co., 100 N. 3d, Philadelphia, Pa. 19

## Belted, Manufacturers of.

Brick Presses. 19

## Door Bolts.

Ives Hobart B., New Haven, Ct. 19

## Door and Gate Springs.

Edwards Mfg. Co., Detroit, Mich. 19

## Door Hangers.

Kidder Slide Door Hanger Co., Romeo, Mich. 19

## Door Locks.

Folger & Co., Springfield, O. 19

## Door Locks.

Sellers Wm. & Co., Phila., and 10 Liberty st., N. Y. 19

## Door Locks.

Thorne, De Haven & Co., Philadelphia, Pa. 19

## Door Locks.

Wiley & Russell Mfg. Co., Greenfield, Mass. 19

## Door Locks.

Edge Tool, 100 N. 3d, Philadelphia, Pa. 19

## Door Locks.

Doehner M. & Co., Chambers, N. Y. 19

## Door Locks.

Edger Light, 100 N. 3d, Philadelphia, Pa. 19

## Door Locks.

Fuller Electrical Co., 41 E. 14th, N. Y. 19

## Door Locks.

Fuller, Makers of. 19

## Door Locks.

Frank Bros. Mfg. Co., Chicago, Ill. 19

## Door Locks.

Stokes & Fulton, Philadelphia, Pa. 19

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## Door Locks.

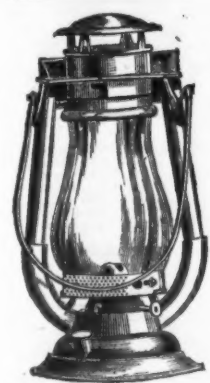
Stokes & Fulton, Philadelphia, Pa. 19

## Door Locks.









## MILLER'S NO. 14 LANTERN

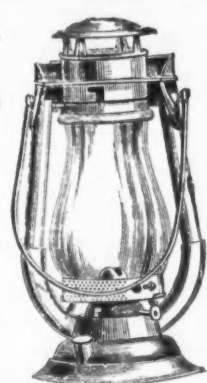
Gives more light and will hold the flame more perfectly than any other Lantern made.



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**Edw'd Miller & Co.,**

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Manufacturers of  
Lanterns,  
Brass Kettles,  
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## AKRON IRON COMPANY, AKRON, OHIO.

Sole Manufacturers of

## Patent Hot Polished Shafting.

Medal of Superiority awarded at American Institute Fair of 1880.

This Shafting is superior to any in the market, and commends itself to the trade for the following reasons, viz:

- 1st. It is perfectly straight and round.
- 2d. It can be finished accurately to any desired gauge.
- 3d. It will not rust or tarnish easily.
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- 5th. Its surface is composed of magnetic oxide of iron, and consequently presents a journal or bearing surface that is unexcelled.
- 6th. The peculiarity of its manufacture is such as to entail loss in making it, if other than superior stock is used. Those purchasing it may therefore be assured of receiving first-class material.

Price lists, catalogues and references furnished on application.  
Where parties desire it we cut keyways or splines any length required, at a moderate charge.

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BRONZED IRON AND BRONZE METAL DOOR TRIMMINGS, BUTTS AND HARDWARE.

**CAST BUTTS, DOOR BOLTS, WELL WHEELS, FLUSH BOLTS, SHUTTER BOLTS, PAD LOCKS,**  
**BARN DOOR HANGERS, & RAIL, CRINDSTONE FIXTURES, SCREW & SIDE PULLEYS, NOISELESS PULLEYS, HAY FORK PULLEYS, SHELF BRACKETS,**

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Having largely increased our facilities and line of goods, we invite the attention of the Trade.

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(Every Iron of our make warranted a perfect cutter.) ALSO,

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No. 39 Murray Street, New York,  
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**ORANGE LIGHTNING,  
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Pamphlets showing sizes of grain sent free.

## "UNION" Door and Gate Spring.

SIMPLE, DURABLE AND ECONOMICAL.  
The Objectionable Features of Other Springs Entirely Overcome.



We Make Four Sizes, viz.:  
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As there are several Springs similar in appearance, but without our improvements, upon the market, see that you buy only the

"Union" Adjustable and Reversible.

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Represented in New York by **Lamson & Goodnow Mfg. Co.**



THE PATENT  
SCREW WINDOW BALANCE

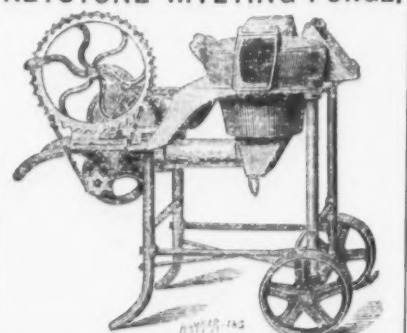
With which the Sashes work as with weights, their application being at an expense of one-half the cost of applied weights, no boxings being required. The Sashes are Locked with the meeting rail lock. Stands alone in its working. Price \$1. per set (four). Discount to the Trade. In use over three years. **Robt. B. Huganin, Sole Maker, Hartford, Ct., U. S. A.**

**MACHINERY FOR  
Straightening and Cutting Wire  
Of all Sizes to any Length.**

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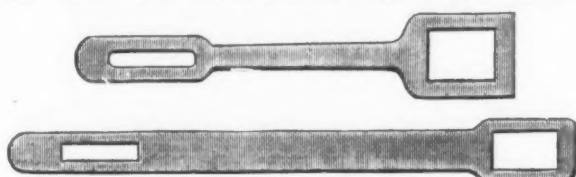
**An Improved Pattern.  
Cheap and Durable.  
BEST IN THE MARKET.**

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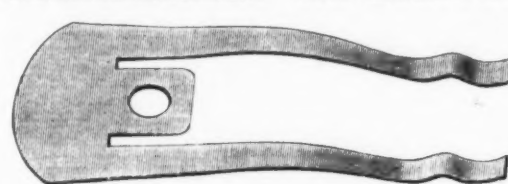
**KEYSTONE PORTABLE FORGE CO.,  
204 North 4th St., Philadelphia, Pa.**

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## STIRRUPS.



## CLEARER SPRINGS.



Prices on Application.

**HENRY B. NEWHALL, 105 Chambers St., NEW YORK AGENT.**  
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## THE GENUINE STEBBINS MOLASSES & OIL GATES, MANUFACTURED ONLY BY E. STEBBINS MFG. CO. BRASS FOUNDERS AND FINISHERS.

Sole Manufacturers

**Stebbins and Brightwood**

COMPRESSION

AND  
GROUND KEY WORK.

Send for circular and price list.

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The Western trade can be supplied by  
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**Office of NELSON LYON,  
SOLE MANUFACTURER OF  
Lyon's Patent Metallic  
Heel Stiffeners,  
Also, Manufacturer of  
BRUSHES  
Of Every Description,  
Nos. 17 & 19 Green St.,  
Albany, N. Y., Dec. 8, 1880.**

**N<sup>o</sup> 3**

**FOR 1/2 INCH HEEL.**

## To All Whom it May Concern:

To-day a decree in my suit against G. T. Fisher & Co., of Detroit, for an infringement of my patent, was made and entered, of which the following is an extract:

At a session of the Circuit Court of the United States for the Eastern District of Michigan, held at Detroit &c., on Wednesday, the 8th day of December, 1880.

**NELSON LYON**  
against  
**GUYON T. FISHER, et al.**

It is ordered, adjudged and decreed, that the act entitled "An act for the relief of Nelson Lyon and Jeremiah S. James," passed by Congress and approved April 1, 1880, &c., is a good, valid and constitutional act.

That the original patent, bearing date July 9, 1872, and numbered 128,843, granted and issued to Joseph Barsaloux, Jeremiah S. James and Nelson Lyon, when corrected by the Acting Commissioner of Patents, as directed by said act, was a good and valid patent.

That the said Joseph Barsaloux was the original and first inventor of the improvements in metallic stiffeners for boots and shoes mentioned and described in said letters patent.

That the said Nelson Lyon was the original and first inventor of the improvements in metallic stiffeners for boots and shoes mentioned and described in said letters patent, as aforesaid, is a good and valid patent; that said Lyon is exclusively possessed of said Letters Patent and the invention thereby secured.

That the defendants, G. T. Fisher & Co., and each of them, have infringed upon the said patents and upon the exclusive rights of said Lyon under the same.

That said Lyon receive of said defendants all the profits, &c., they have made, and in addition thereto all the damage he has suffered by reason of the infringements by the defendants, and also the costs, charges and disbursements in the action.

It is also further ordered, adjudged and decreed, that a perpetual injunction be issued against said defendants, according to the prayer of the said complainant's bill.

You are also hereby notified that the perpetual injunction has been issued and served on the defendants.

All questions as to damages and settlements in relation to infringements under my patents must be addressed to and made with my attorney, **WILLIAM H. KING**, in my care at the above address.

**NELSON LYON.**

## Wilson Bohannon, Manufacturer of Patent

## BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.

Patent Horizontal Rim Cylinder Night Latch.

Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob.

**PASSENGER CAR LOCKS**, Bronzed, Nickel-Plated and Japanned.

Catalogues and samples sent upon application.



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<b>Rail.</b>	Sliding Door Wrought Brass, 1/2" x 1/2" x 1/2" dia 1000	15
	Barn Door, 1/2" x 1/2" x 1/2" dia 1000	15
	for N. E. Hanger	15
	Per 100 feet, 2.00	15
	Small, Med. Large,	15
	2.70 3.30 net	15
<b>Razors.</b>	J. R. Torrey Razor Co.,	15
	Genuine Emerson,	15
	Emerson's (not Emerson),	15
	Emerson's,	15
	Hunt's,	15
	Chapman,	15
	Saunders,	15
	Torrey's,	15
	Iron and Tin,	15
	In bulk, list of May 21,	15
	Copper Rivets and Bars,	15
	No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	15

<b>Shovels and Spades.</b>		
Ames, New list, July 1, 1881,		dis 15 1/2
Griffiths,		do 20 1/2
Old Colony,		do 15 1/2
Payne Pettibone & Son, new list,		do 20 1/2
R. H. Shovel Co.,		do 15 1/2
Remington's (Lowman's) Patent,		do 20 1/2
Rowland's,		do 20 1/2
<b>Shovels and Tongs.</b>		
Iron and Brass Head, R. & E. list,	dis 20 1/2	15 1/2
Polished Steel	new list,	dis 20 1/2
<b>Shovels.</b>		
Square Frames	by case,	dis 70 1/2
Spoke Shavers	case	dis 60 1/2
<b>Spoke Shavers.</b>		
Defiance Metal		dis 20 1/2
Iron		dis 15 1/2
Wood		dis 20 1/2
Woolley's (Stanley & Co.) new list,		dis 20 1/2
Stearns		dis 20 1/2
<b>Spoke Trimmers.</b>		
Bonney's	do 20 1/2	dis 15 1/2
Stearns	do 20 1/2	dis 20 1/2
Woolley's	do 20 1/2	dis 20 1/2
Woolley's	No. 1, \$1.00; No. 2, \$1.20; No. 3, \$1.40; No. 4, \$1.60; No. 5, \$1.80; No. 6, \$2.00; No. 7, \$2.20; No. 8, \$2.40; No. 9, \$2.60; No. 10, \$2.80; No. 11, \$3.00; No. 12, \$3.20; No. 13, \$3.40; No. 14, \$3.60; No. 15, \$3.80; No. 16, \$4.00; No. 17, \$4.20; No. 18, \$4.40; No. 19, \$4.60; No. 20, \$4.80; No. 21, \$5.00; No. 22, \$5.20; No. 23, \$5.40; No. 24, \$5.60; No. 25, \$5.80; No. 26, \$6.00; No. 27, \$6.20; No. 28, \$6.40; No. 29, \$6.60; No. 30, \$6.80; No. 31, \$7.00; No. 32, \$7.20; No. 33, \$7.40; No. 34, \$7.60; No. 35, \$7.80; No. 36, \$8.00; No. 37, \$8.20; No. 38, \$8.40; No. 39, \$8.60; No. 40, \$8.80; No. 41, \$9.00; No. 42, \$9.20; No. 43, \$9.40; No. 44, \$9.60; No. 45, \$9.80; No. 46, \$10.00; No. 47, \$10.20; No. 48, \$10.40; No. 49, \$10.60; No. 50, \$10.80; No. 51, \$11.00; No. 52, \$11.20; No. 53, \$11.40; No. 54, \$11.60; No. 55, \$11.80; No. 56, \$12.00; No. 57, \$12.20; No. 58, \$12.40; No. 59, \$12.60; No. 60, \$12.80; No. 61, \$13.00; No. 62, \$13.20; No. 63, \$13.40; No. 64, \$13.60; No. 65, \$13.80; No. 66, \$14.00; No. 67, \$14.20; No. 68, \$14.40; No. 69, \$14.60; No. 70, \$14.80; No. 71, \$15.00; No. 72, \$15.20; No. 73, \$15.40; No. 74, \$15.60; No. 75, \$15.80; No. 76, \$16.00; No. 77, \$16.20; No. 78, \$16.40; No. 79, \$16.60; No. 80, \$16.80; No. 81, \$17.00; No. 82, \$17.20; No. 83, \$17.40; No. 84, \$17.60; No. 85, \$17.80; No. 86, \$18.00; No. 87, \$18.20; No. 88, \$18.40; No. 89, \$18.60; No. 90, \$18.80; No. 91, \$19.00; No. 92, \$19.20; No. 93, \$19.40; No. 94, \$19.60; No. 95, \$19.80; No. 96, \$20.00; No. 97, \$20.20; No. 98, \$20.40; No. 99, \$20.60; No. 100, \$20.80; No. 101, \$21.00; No. 102, \$21.20; No. 103, \$21.40; No. 104, \$21.60; No. 105, \$21.80; No. 106, \$22.00; No. 107, \$22.20; No. 108, \$22.40; No. 109, \$22.60; No. 110, \$22.80; No. 111, \$23.00; No. 112, \$23.20; No. 113, \$23.40; No. 114, \$23.60; No. 115, \$23.80; No. 116, \$24.00; No. 117, \$24.20; No. 118, \$24.40; No. 119, \$24.60; No. 120, \$24.80; No. 121, \$25.00; No. 122, \$25.20; No. 123, \$25.40; No. 124, \$25.60; No. 125, \$25.80; No. 126, \$26.00; No. 127, \$26.20; No. 128, \$26.40; No. 129, \$26.60; No. 130, \$26.80; No. 131, \$27.00; No. 132, \$27.20; No. 133, \$27.40; No. 134, \$27.60; No. 135, \$27.80; No. 136, \$28.00; No. 137, \$28.20; No. 138, \$28.40; No. 139, \$28.60; No. 140, \$28.80; No. 141, \$29.00; No. 142, \$29.20; No. 143, \$29.40; No. 144, \$29.60; No. 145, \$29.80; No. 146, \$30.00; No. 147, \$30.20; No. 148, \$30.40; No. 149, \$30.60; No. 150, \$30.80; No. 151, \$31.00; No. 152, \$31.20; No. 153, \$31.40; No. 154, \$31.60; No. 155, \$31.80; No. 156, \$32.00; No. 157, \$32.20; No. 158, \$32.40; No. 159, \$32.60; No. 160, \$32.80; No. 161, \$33.00; No. 162, \$33.20; No. 163, \$33.40; No. 164, \$33.60; No. 165, \$33.80; No. 166, \$34.00; No. 167, \$34.20; No. 168, \$34.40; No. 169, \$34.60; No. 170, \$34.80; No. 171, \$35.00; No. 172, \$35.20; No. 173, \$35.40; No. 174, \$35.60; No. 175, \$35.80; No. 176, \$36.00; 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See Page 3.

Steel.

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Analysis of "Magdalena" Ore.

Silica.....	4.05
Peroxide of Iron.....	84.60
Oxide of Manganese.....	1.65
Alumina.....	1.34
Lime.....	0.33
Magnesia.....	traces
Phosphoric Acid.....	0.04
Sulphuric Acid.....	0.42
Combined Water.....	5.97
Moisture.....	2.43
	100.43

Metallic Iron..... 59.72

The Sulphuric Acid exists as Sulphate of Lime  
and is, in my opinion, not detrimental.  
Signed, E. D. RILEY, F. C. S.

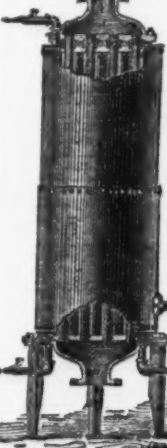
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FOR



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Present Annual Capacity of these Works.	Fish Plates.....15,000 tons
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	Pig Metal.....140,000 "
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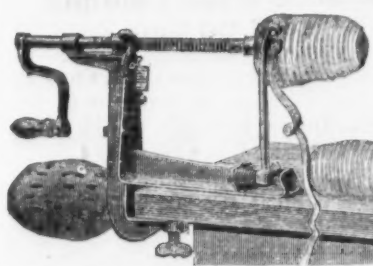
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taking off a thinner paring from every shape or  
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Every Machine warranted as represented.

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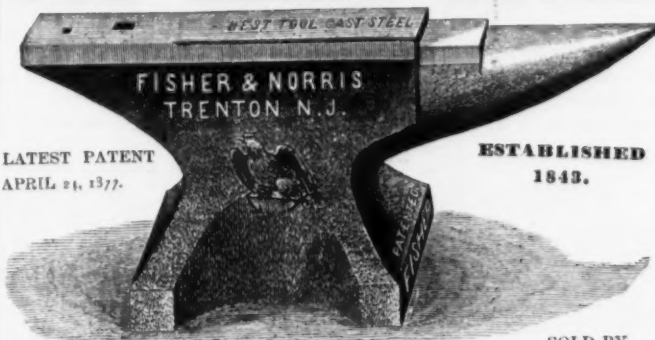
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Better than the Best English Anvil.



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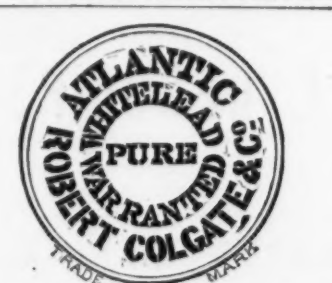


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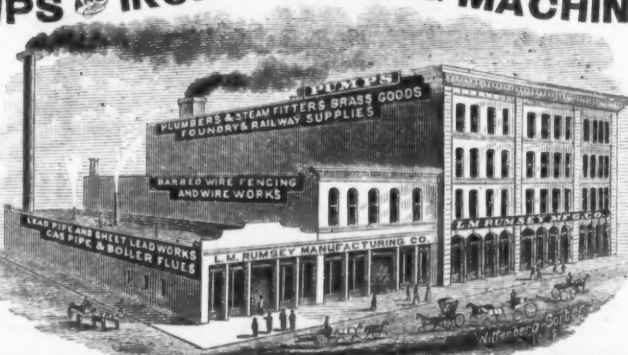






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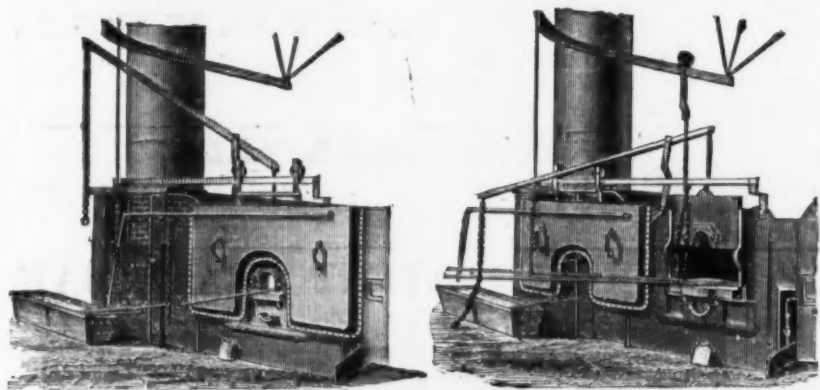


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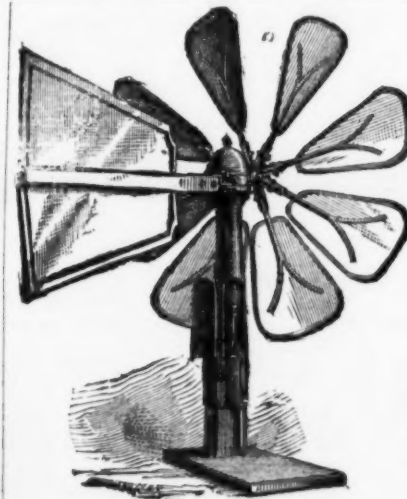
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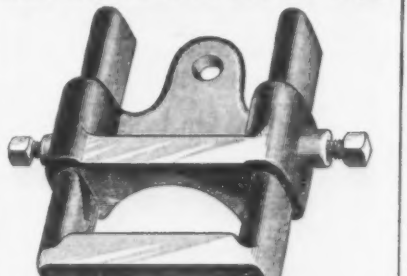
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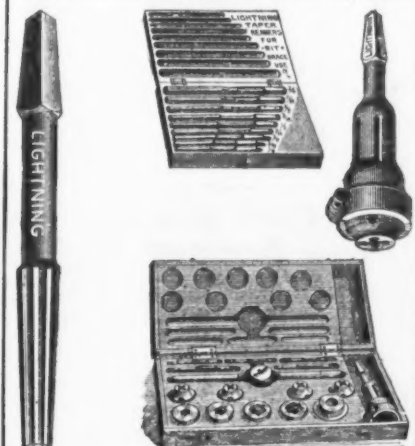
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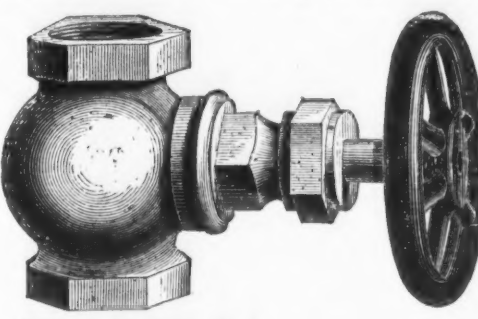
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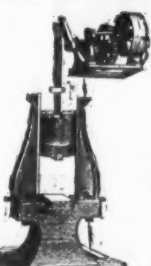

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WOOD SCREWS, TANK RIVETS, FLAT LINK CHAIN.



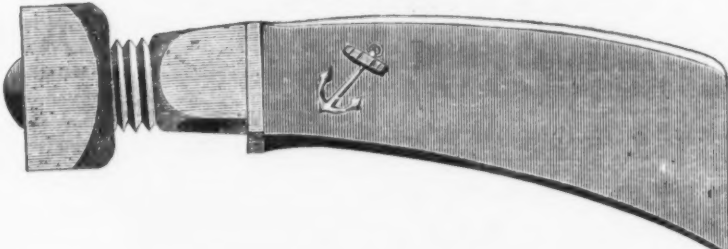
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Can be attached to any drop now in use.  
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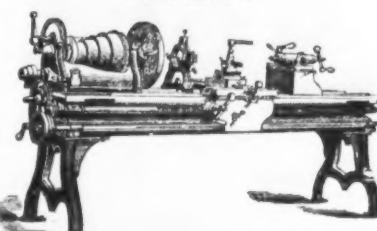
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Has no superior, and is a sure and  
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The Mice go in at a rapid rate,  
And each one sets it for his mate.  
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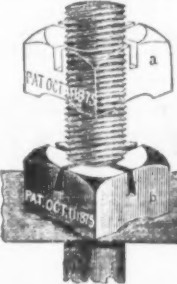
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will upset tire from 1/2 inch wide to a heavy log  
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For circular address,  
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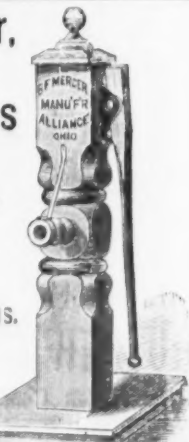
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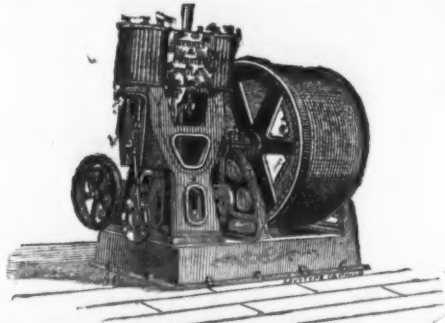


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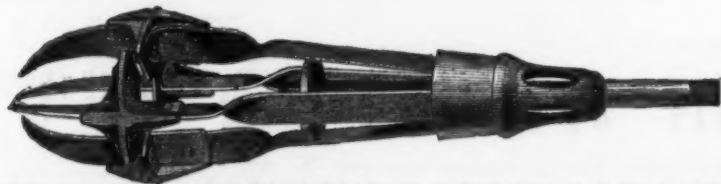
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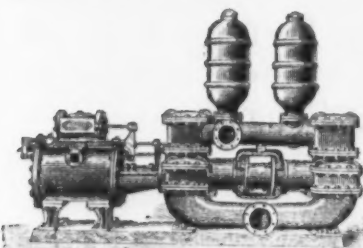
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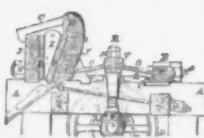
## KEYSTONE STEAM PUMP WORKS, PUMPS



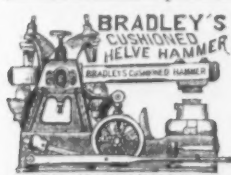
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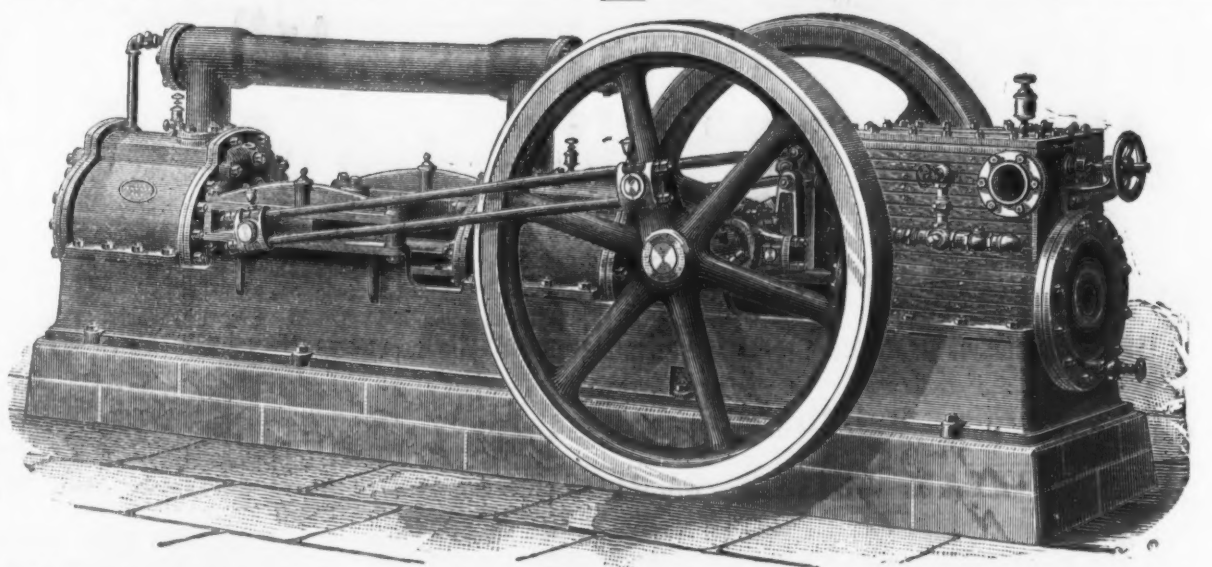
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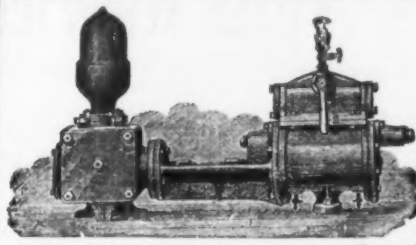
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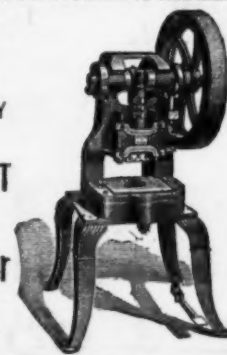
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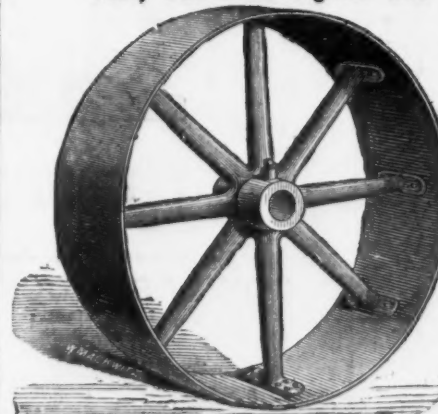
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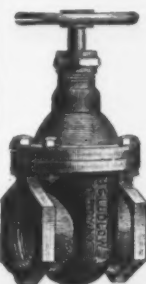
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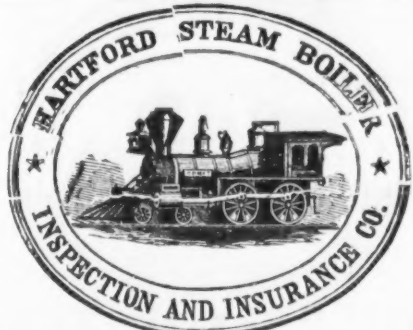
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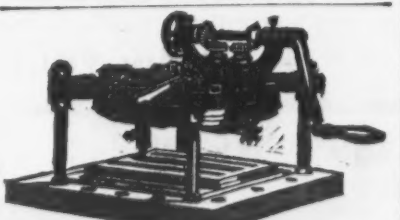
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Power, Foot or Hand  
 Punches and Shears; all  
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PATENT PORTABLE VALVE SEAT  
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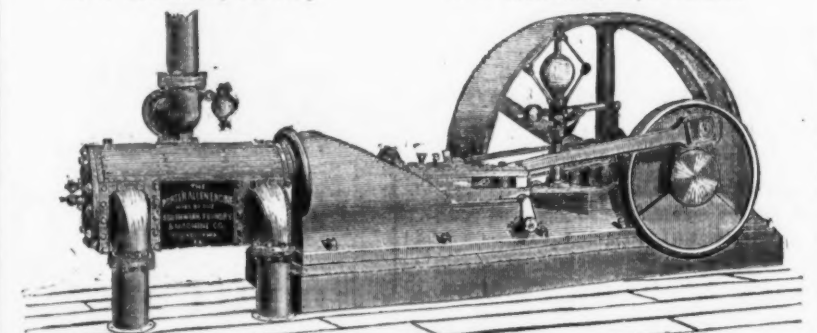
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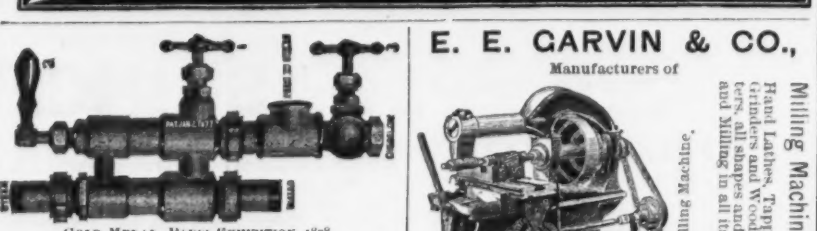
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 ONCE MORE AHEAD.

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PULSOMETER STEAM PUMP CO.:  
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 I congratulate you on the improvement. I have discovered you have  
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 Yours truly,  
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 Send for book giving full description, reduced prices, and many  
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 No adjustment necessary for varying steam pressures.  
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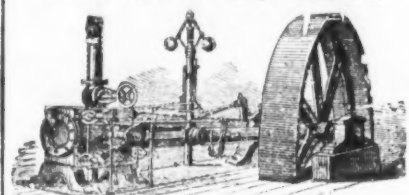
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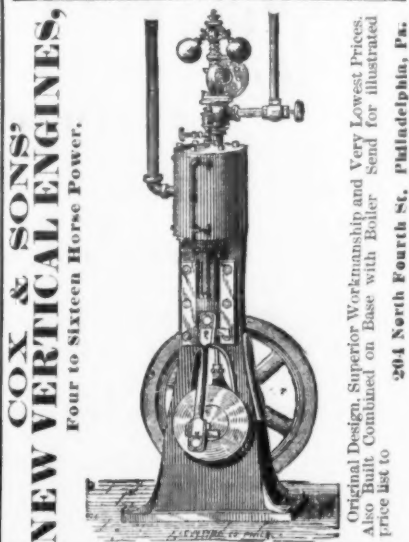
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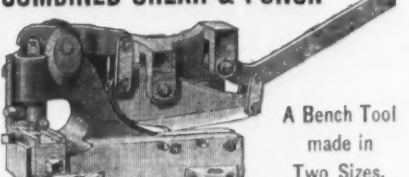
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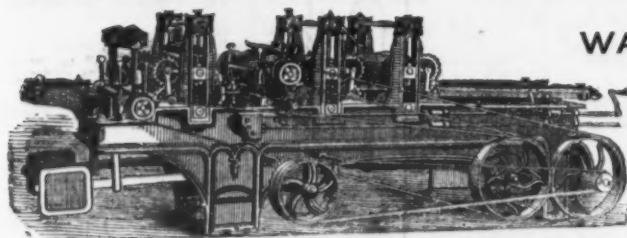
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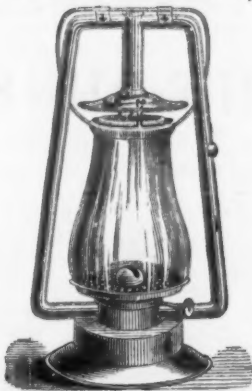
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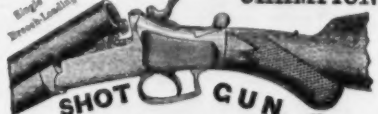
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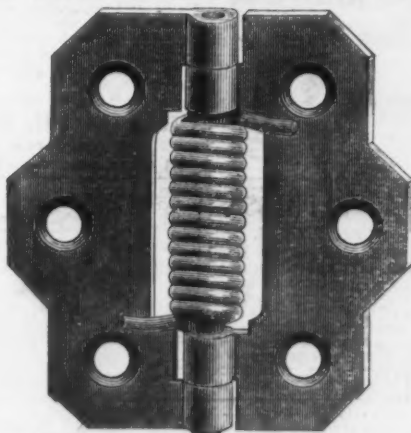
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